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META FORUM 2010

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Challenges for the Audiovisual Industry in the Digital Age: Accessibility and Multilingualism

This document is part of the Network of Excellence "Technologies for the Multilingual European Information Society", co-funded by the 7th Framework Programme of the European Commission through the contract T4ME, grant agreement no.: 249119.

Abstract

Every facet of life in the 21st century is defined by technological advances in digitisation and networked communication, which result in endless information exchange. Such developments would seem to uphold the very core of democracy as regards freedom of speech and accessibility of information. But is information truly accessible? The mind boggling amount of content made available every day through a variety of media has already resulted in an increased need for making such information accessible both to speakers of different languages as well as to people with disabilities, who have the inalienable right to quality of life. Such demand is only going to increase exponentially in the years to come. This is certainly true of the audiovisual industry, as translated audiovisual content made available through the various distribution channels that exist today probably reaches a wider audience than any other type of translation. The audiovisual industry is thus experiencing an ever increasing demand for audiovisual translation services, yet at the same time is forced to contend with the reduction of budgets as well as the contraction of timeframes in which these services need to be provided. As an industry which has strong links with and is heavily influenced by changes in technology, it is only natural to turn to language technology experts seeking from them solutions to meet the demand and deliver quality end products.

Hello everyone.

I am honoured to be here, among such distinguished company. I was only made aware of META-NET and META-FORUM about a month ago at the *Languages & the Media 2010* conference[1] in Berlin. I was very surprised to be asked to present a keynote speech at this conference, given that my experience and background are very different to that of most of the speakers here today.

So let me first introduce myself. I am the Managing Director of the European Captioning Institute, a London based company that provides an array of language services, specialising in Audiovisual Translation (AVT) of any type. We are one of the first companies to have pioneered centralised multilanguage subtitling for DVD purposes. Apart from subtitling and captioning of every type and for all media, we also offer specialised text translation, interpreting, voice over, audio description and transcription services in over 70 languages. We have worked with just about every major Hollywood Studio, while our clientele also includes small studios, broadcasters, independent producers, distributors and post production houses, advertising agencies, corporate clients, governmental and educational organisations, as well as other language service providers.

I thought it would be appropriate to talk about our experience in the audiovisual industry over the past decade, hoping to give you an idea of the challenges we are facing today and the solutions we need in order to overcome them. And to do so, we need the help of Language Technology (LT) experts – you.

The beginnings of the AVT industry can be traced back to the birth of film, when subtitles first appeared as 'intertitles' in the silent film era. It was the sound film era though, or the 'talkies', that really gave shape to the AVT industry in the 1930's. The two main types of AVT that were developed were subtitling and revoicing. Subtitling, as we all know, refers to any type of translation of original dialogue appearing as lines of text typically positioned towards the foot of the screen and timed to

[1] http://www.languages-media.com/

appear and disappear in sync with the dialogue. Revoicing, on the other hand, refers to any type of replacement of the original voice track with a new one, and includes lip sync dubbing, voice over and free commentary. Today there are additional types of AVT, such as surtitling for the theatre and the opera, sign language interpreting on the screen, and audio description as well as spoken subtitles for the visually impaired. All these types aim to offer accessibility to the media and various forms of entertainment to people with disabilities.

I would like to focus on subtitling today, as this is the AVT type that seems to have grown faster in the past few years, to the extent that traditionally dubbing countries, such as Spain, France, Germany and Italy, as well as countries with a tradition in voice over, such as Poland and other Central and East European countries, are now also embracing subtitling as a major audiovisual translation mode (interlingual or intralingual) to be offered in their internal markets. According to Diaz Cintas (2005:19)[2] out of the three main audiovisual translation methods employed in Europe, i.e. subtitling, dubbing and voice over, subtitling is the one that has not only grown the most but is expected to grow further in the future, making it the supreme audiovisual translation method, due to three main advantages: it is the quickest and most economical method, and it is also suitable to any type of programming. Another reason why it would make sense to focus on subtitling here is that its practice has changed much more drastically than any type of revoicing, where the production process remains largely the same. Subtitling itself can be classified into several distinct categories, depending on the languages involved (i.e. 'interlingual' from one human language to another, and 'intralingual' that refers to subtitles in the same language), the method of broadcast of the subtitles (i.e. prerecorded, semi-live or live), as well as the method of preparation of these subtitles.

AVT was not recognised as an official translation genre until very recently, with research and a comprehensive theoretical framework being set up towards the end of the 20th century. Universities picked up on the gap in the market in the late 90's and recognised the need for educating and training prospective subtitlers. So we now have many universities offering modules and courses on subtitling and audiovisual translation in general, but also very specialised courses for particular subtitling types, such as intralingual hard-of-hearing subtitling (SDH), as well as audio description (AD) or video game localisation. Interestingly enough, training in using LT is not part of audiovisual university curricula to this date.

For the largest part of the 20th century the profession of the subtitler was relatively undefined. This was because, since the birth of interlingual subtitling, the way subtitles were created and presented on the screen has been going through many changes, mainly dictated by developments in technology. In the beginning, the work was commonly split between translators that provided the text of the subtitles and typists and technicians. These people, who did not necessarily understand the language of the film, provided the spotting, i.e. the in and out times of the subtitles, and they were the ones responsible for getting

[2] Diaz Cintas, Jorge (2005) "The Ever-Changing World of Subtitling: Some Major Developments" in Research on Translation for Subtitling in Spain and Italy, Sanderson John (ed), Universidad de Alicante, pp. 17-26

the subtitle text on the screen. In the mid-1980's PCs and timecodes revolutionised the process of interlingual subtitling and it was possible for a single person to be in charge of spotting the subtitles, writing the text, as well as reviewing them on the screen altering timings or text as s/he saw fit prior to transmission. Training for such work was mainly on the job training at the various subtitling studios and the people that were employed there mainly came from a languages background.

The fast-paced technological developments in the industry, mainly since the advent of digital television and the DVD in the late 1990's, were bound to set yet another milestone in terms of subtitle production. The proliferation of television channels broadcasting 24/7 at regional, national and international levels created an increase in the programming available. Also, the appearance of digital video formats in the market brought with them the possibility of centrally controlled services, such as the provision of multilingual subtitling for DVD releases. In the past decade, the subtitling industry has witnessed regional variation being slowly subsumed by global production.[3] This has come as a direct result of the requirements imposed on the market by the large Hollywood studios. First of all, the quantity of DVD subtitling boomed to such an extent in the beginning of the millennium, that the ability to produce subtitles in 40 or more languages simultaneously, at fast turnarounds, became imperative for many companies. Piracy was one of the major factors underlying the new state of things. Studios were, and still are, losing millions of dollars to piracy every year. They also needed to find ways to control their assets better, and this was achieved by storing them centrally rather than sending them all over the world. Day and date releases became more widespread for marketing reasons, but also as part of the move on the studio front to close the windows between theatrical and DVD releases so as to combat piracy. And of course, cost was the third market force in play. Central production of DVDs/BDs as opposed to local production was less expensive for studios, both in real terms, but also in terms of indirect costs, such as studio administration. Finally, there were copyright issues to deal with. Studios generally do not have the infrastructure to deal with and negotiate copyright. They would thus pass on this responsibility to their vendors, who were asked to pass on copyright back to the studios. This made it easier for studios to keep track and archive their assets, such as subtitle files, and hold the copyright to re-use them as necessary for adaptation or reformats to other media, e.g. for broadcast, VOD, airline releases, etc. As I will explain in detail, this need for centralised production of subtitle files has given birth to a new working methodology, which lends itself as the ideal environment for the application of LT.

International subtitling companies came along, that responded to this need and created new working processes, on the basis of centralised subtitle creation. The subtitling process was split in two and a new type was born; some refer to it as 'relay' subtitling, a term originally used in interpreting. In this new way of subtitling, first a (typically) English subtitle template is created. This 'template' provides the basic structure of a subtitle file with fixed timings, which is then translated into all the

[3] For more information see also: Georgakopoulou, Panayota (2006) "Subtitling and Globalisation" *The Journal of Specialised Translation* Vol 6, July 2006, pp. 115-120 http://www.jostrans.org/issue06/art_georgakopoulou.php

languages required. This new method of subtitling caused a lot of brouhaha among traditional subtitlers and companies strongly embedded in local markets. They saw this change as a threat to their profession and immediately raised the issue of potential loss of quality, on the grounds that the subtitling styles followed in each country obey local norms that have been created in response to local needs and should not be changed but respected. It was of course true that the changes in the working processes that I just described could conflict with existing subtitling norms in each country and soon enough international subtitling norms started making their appearance. In fact, my PhD research was precisely on the topic of text reduction, which is the main translation technique employed when translating for subtitles, and the conventions on the matter across Europe[4]. The research I have conducted in respect of the reduction of speech from the audio to the subtitles in Greek subtitle files, shows that it is only a maximum of 70% of the original audio on average that makes it as text in the subtitles. I'm sure the situation is similar in other languages. My research has also shown that the method of 'relay' subtitling, or the use of English template files, represents a convergence of subtitling trends across Europe.

The other important change the DVD brought along was the availability of subtitling to audiences previously not accustomed to it. For example, we now see an increase in the amount of subtitled output viewers in traditionally dubbing countries enjoy. This is primarily a result of mandates for the provision of intralingual hard of hearing subtitling for broadcast purposes (e.g. France, Spain). We also witness an increase in the demand and availability of subtitling in Central and East European countries that follow a tradition of voice over (or 'lectoring' as it is called), such as Poland. Undoubtedly, this trend will increase, and it will bring with it a further increase in the demand for subtitling services, which will give further reason for LT to be employed in order to cater for this demand.

On the intralingual subtitling front, or captioning as it is called in the States, our American colleagues have led the way. Captioning started in the States back in the 70's and I am proud to say that our founding company, the National Captioning Institute (NCI)[5], was the one that invented Line 21 closed captioning. There are many different types of intralingual subtitles or captions, the main one being their method of transmission, i.e. whether they are pre-recorded, semi-live or live. There are also further distinctions among each type, so for pre-recorded captions, there is a choice between pop on placed captions (i.e. captions placed under the speaker), pop on centred captions and timed roll up captions, all of which can be created with different styles. The people working as captioners come from a linguistic background mainly, but when it comes to live captioners, initially these were court stenographers trained in captioning and employed to stenocaption live programmes.

[4] My PhD research has recently been published: Georgakopoulou, Panayota (2010) *Reduction Levels in Subtitling. DVD Subtitling: A Convergence of Trends* Saarbrücken: Lambert Academic Publishing

[5] www.ncicap.org

The developments in speech recognition technology revolutionised captioning, and mainly live captioning, in the beginning of our century. Until then, the quality threshold of speech recognition technology was too low for it to be effectively used in live captioning. NCI was among the first companies in the States to really invest in speech recognition technology and have employed it since 2002, approximately 4 years ahead of most captioning companies in the States. Speech recognition is currently only used for about 15% of the live captioning production in the States, while stenocaptioning is still the predominant method. However, the use of speech recognition technology is growing rapidly. We now see speech recognition technology employed in the live subtitling market in Europe as well.

Speech recognition is also used in offline captioning, as it is called in the States, or pre-recorded teletext subtitling, as it is called in Europe, to an extent. In the States, the methodology is to use speech recognition technologies to create transcripts of the audio in a quick and cost effective way, which can be then easily turned into caption files by experienced editors. The method of using transcripts as the first step in the creation of offline subtitle files came about in the States recently as a result of a steep drop in prices in the captioning market .It was also due to the fact that many companies provide cheap transcription solutions using operations abroad, in English speaking countries such as India or the Philippines. The results produced in such countries require heavy editing from native speakers, due to significant quality issues. To be specific, employees in such companies often have problems understanding regional US accents or references to culture-specific concepts (e.g. pop culture). An alternative that has only just made its appearance is the use of speech recognition technology to create these initial transcripts in an affordable way. This method is called 're-speaking', i.e. using trained employees to dictate the audio to a speech recognition system that turns it into text, which then requires little editing for quality purposes. There is still a long way to go before speech recognition is used to its full capacity in the offline captioning market, though it is my belief that this will happen much sooner than many people realise. I do not see major hurdles in employing speech recognition technologies in combination with appropriate subtitling software, not for the creation of transcripts, as has been the case so far, but for the use of such technology by re-speakers to create offline captions directly. This would circumvent the transcript step, speed up the process and create further time and cost benefits.

In Europe, speech recognition has been used to a limited extent in an alternative hybrid workflow process, where the subtitler inputs the text written out in proper subtitle format and the speech recognition system built in the subtitling software provides timings to subtitles based on the onset of speech in the audio[6]. Such technology has only really been applied so far to intralingual subtitling, where synchronisation of subtitles is made to the onset of utterances, even if such utterances are hesitations, false starts, unfinished or heavily ungrammatical constructions or exclamations. In addition, intralingual subtitles tend to carry higher reading speeds than interlingual subtitles. This may sound surprising, as deaf viewers are generally viewed to be slow readers, but it

[6] An example of such technology is Softel's Swift Create TiGo. For more information see www.softel.co.uk

is still a fact[7]. This also means that a larger amount of text can be recorded in the subtitles, which makes the implementation of speech recognition solutions easier. The last point to be made here is that good speech recognition systems are only developed so far for very few languages. The two main speech recognition engines in use today are Dragon[8] and ViaVoice[9] and they cater for a very limited number of languages so far.

Some interesting research is being carried out now on a European scale with the DTV4ALL project[10], where the preferences of deaf viewers across Europe are being recorded so as to reassess their needs and propose new intralingual subtitling standards in Europe. The preliminary findings of this research were presented at the *Languages & the Media 2010* conference in Berlin last month and one of the suggestions was the provision of different types of intralingual subtitles in accordance with the audience's needs (e.g. deaf people (born deaf or not), severely hard of hearing people, hearing people that like to use intralingual subtitles, deaf/hard of hearing children, etc)[11]. Hopefully one day this will come true, but for now such a suggestion would be viewed as largely utopic, as we are not even at the point yet where one stream of SDH subtitling is available to viewers for 100% of the content available.

Some countries are more advanced in this area, with UK leading the way with legislation making SDH subtitles, audio description and signing obligatory for broadcasters. OFCOM sets the targets in the UK through the Code on Television Access Services[12] as to the amount of TV subtitling, signing and audio description that broadcasters must provide. It also provides guidance on how access services should be presented and monitors the performance of broadcasters.

Accessibility is also a focal concern of the European Union. The EU adopted a *New Community Disability Strategy* in 1996, which focuses on equal opportunities for disabled persons. This was further developed in a new policy framework in 1999 whereby the removal of barriers to full participation is targeted in all areas of life[13]. It is estimated that about 10 percent of the world's population – or around 650 million people – live with a disability of some sort, so ensuring easy and effective communication for all is not a "fringe issue" but rather a significant challenge14. If we take into account trends in population growth, medical advances and an increasingly ageing population, this number will grow further.

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[7] This is a perception that does not hold. Through the use of closed captioning, especially near verbatim, the user's reading speed increases to keep up with the caption stream. It may be skim reading or partial reading, but the results are similar to speed reading training available in the '60s and '70s in the USA.

[8] http://www.nuance.com/dragon/index.htm

[9] http://www-01.ibm.com/software/pervasive/embedded_viavoice/

[10] http://www.psp-dtv4all.org/

[11] Suggestion presented by Henrik Gottlieb, University of Copenhagen, Denmark, at the Panel "DTV4ALL: The Reception of SDH in Europe"

[12] http://stakeholders.ofcom.org.uk/broadcasting/broadcast-codes/code-tv-access-services/

[13] http://www.europa.eu.int/comm/employment_social/disability/stretegy_en.html

[14] http://www.itu.int/themes/accessibility/

The Audiovisual Media Services Directive was published in the Official Journal of the European Communities on 18th December 200715. It "amends the Television Without Frontiers Directive in a number of areas" and promotes media literacy and "access for persons with a hearing or visual impairment". In particular, it stipulates in Article 7 that:

> Member States shall encourage media service providers under their jurisdiction to ensure that their services are gradually made accessible to people with a visual or hearing disability.

And they are to do this through the use of sign language, subtitling, audio description and easily understandable menu navigation.[16]

Legislation in terms of accessibility exists in other European countries apart from the UK to a lesser or greater extent. Several EU countries currently have legislation mandating the accessibility of TV programming for the deaf and the hard of hearing through subtitles and sign language, whereas other countries offer such services even without relevant legislation. There is currently no legislation on the provision of audio subtitling in Europe for the benefit of visually impaired viewers, though this service is offered in some countries, and although the UK is still the only country that has legislated the provision of AD services, AD guidelines already exist in quite a few EU countries and the service is increasingly offered by various member states.[17]

AD is a service that is relatively new to audiences. It is a technique that has been developed to provide visual information to blind viewers and viewers with low vision and it can be used in TV broadcasts, DVDs, theatres, museums, etc. It has existed since the early '80s but has only really been developed to a significant level in the beginning of the 21st century. Today, audio described material on television, in the cinema and on DVDs is on the increase and several European countries, USA, Canada and Japan are benefiting from this service.

AD was a service we pioneered at ECI into Greek for the first time in 2009[18]. Audio-described programming is now broadcast on Greek TV for the first time and a survey will ensue the broadcasts, and it is expected to have a significant impact on the future of this service. A major concern is the cost of the AD service, which is currently approximately 3 times more expensive than sign language and 7 times more expensive than subtitling for the hard of hearing.

The costs of AD in Greece are comparative to other countries. Although it is usually the same material that is being audio-described as well as subtitled, technologies have not been developed yet to make use of available subtitle material so as to make the AD process quicker, easier and more cost effective. When thinking of AD one would probably place the service closer to any other type of revoicing, rather than subtitling, as it involves replacement of the audio track of a programme with a new recording that is mixed with the original dialogue and M&E

[15] http://www.dcenr.gov.ie/NR/rdonlyres/E9366B9E-08A4-482E-B5A5-224927620939/0/AudiovisualMediaServicesDirective18122007.pdf

[16] http://ec.europa.eu/avpolicy/reg/tvwf/access/index_en.htm

[17] For more information, see: http://www.euroblind.org/fichiersGB/access-TV.html

[18] For more information see also: Georgakopoulou, Panayota (2009) "Developing Audio Description in Greece" *Mulitlingual* #108 Vol. 20 Issue 8, December 2009, pp. 38-42

tracks. Nevertheless, except for the audio recording side of the production, the working process involves both software as well as skills that bear more affinity to subtitling than any type of revoicing. The workstations used to produce AD scripts resemble subtitling workstations and are typically developed by companies that also produce subtitling software. The timing skills involved in creating AD scripts are the same timing skills that are employed when subtitling. In a way, one could say that a subtitle file is the exact opposite of an AD script file, in the sense that one provides written text for the timings the other doesn't cover. It would be possible in theory then, for the majority of the programming that is both subtitled and audio-described, to first create the subtitle file and then use it to create a new file with timings that would represent the gaps between all the subtitles in the file. Such a pre-processed file could serve as the basis of an AD file, as all the times in which an AD script could be inserted would have already been spotted. Also, much in the same way that base 'template' files have been used in the multilingual subtitling process for DVDs, such template files could also be prepared and used for AD script writing in cases of the same programming being audio-described in multiple languages. This is interesting in the sense that it would streamline AVT work and produce time and cost benefits both for subtitling companies and their clients.

I previously mentioned developments in interlingual subtitling, the creation of new workflows and working models. Subtitling technology has also continued to develop over the years, providing efficient solutions to the management and QC of subtitle files, by automating many steps in the process that used to be performed manually and that are now done almost at the click of a button. Text editing is also assisted with features that are common in word processing tools, such as spell checkers, as well as automated checks for optimum subtitle length according to the selected reading speeds and timing. Technology has also helped make possible the repurposing of existing subtitle files, so that time and cost savings are made when going from one medium to the other (theatre, to DVD/BD and now 3D as well, to broadcast, VOD, internet streaming etc).

As subtitling and audiovisual translation in general is so closely related to technology, it is expected that anyone interested in working in the field needs to also have very good ICT knowledge and to be willing to become familiar with technologies that are constantly being developed. It is increasingly true that subtitlers need to have a deeper understanding of more technical matters, such as video standards and video encoding, in order to be able to do their jobs more effectively. It is notable that this involves training that is not provided at universities and that is relatively hard to provide on the job, as the professionals employed mainly have a humanities background which is often incompatible with technology. The need for further interdisciplinarity is evident and the universities are called to respond to these new and ever-changing demands in the industry. When I was teaching subtitling at university level over a decade ago, I had to do so *without* the use of subtitling software. I thus had to give students rough rules of thumb on how to estimate subtitle duration and reading speed. Nowadays, universities typically make deals with software providers and get professional suites at a reduced cost and are in a position to offer real practical training to their students. It is true that universities have come a long way in the past decade, they have stepped up to the plate and are

quickly catching up with developments in technology, but there's still a lot be done. I have every reason to believe that they will continue to go with the technological flow and adapt their programmes to the needs and changing landscape of the industry.

Finally, although the sheer volume of content to be made accessible, intralingually or interlingually, is increasing exponentially, the timeframes within which it has to be made accessible are decreasing, while the pressure to reduce production costs becomes greater. In terms of the latter, we have witnessed a drop in prices of about 50% in the past decade, and a similar or higher drop in turnaround times. The situation in the intralingual subtitling industry is similar in those countries where it has flourished. For example, live captioning rates in the States have gone down by approximately 40% in the past 3 years alone and well over 50% if we look at live captioning prices over the past decade. Speech recognition technology has been the tool that captioning companies have used to remain competitive and is the future for them, as rates are continuing to drop, whereas programming is increasing. The same thing has happened, albeit with a delay, in the interlingual subtitling industry. Despite the important technological developments in management and manipulation of subtitle files, the use of highly developed software for reading speed calculation, shot frame detection and automation of many of the technical elements in the process, as well as the relatively easy repurposing of pre-existing subtitle files, the translation side is still done manually. This has put an immense strain both on companies and individual subtitlers, who are asked to cut down on costs in the process, without really being able to automate half of it. This has resulted in a drop in the quality of the subtitle files, as per the widely known project management triangle problem: time, cost, quality – pick any two.

As there is no indication that turnaround times or prices will go up, or that volume will go down, quite the contrary actually, in my view it is machine translation that has to provide the solution to this challenge we are faced with today. In order to maintain the balance between all three sides of our project management triangle (time, cost, quality) and satisfy the demands of content providers and consumers, we will need first to provide an ever increasing volume of subtitles of all types to cater for all audience needs, so that we can all live in a truly democratic society where information is accessible to all, irrespective of disabilities, nationalities and language barriers. We will also have to do this within reduced timeframes (with 100% live being the ultimate aim for certain types of content), and finally this will have to be done at affordable prices so that the information can indeed be made accessible to the masses.

Machine translation was feared and even mocked when it was introduced in the text translation industry. It was first applied in texts that were ideal for this type of work, i.e. mainly technical manuals, where sentence construction normally follows very simple syntactic patterns and vocabulary is limited, while terminology, which needs to be translated consistently and correctly, abounds. And now, a few years on, machine translation is the essential tool used among large language service providers, who have streamlined their working processes accordingly and demand such competencies and skills of their staff. Machine translation is also taught at universities as part of specialised translation syllabuses.

Not too long ago we also heard of IBM and Lionbridge announcing a partnership with a view to advancing the development and commercialisation of real-time translation automation. The industry reaction on this has ranged from very positive to extremely negative, but the truth of the matter is that, to an extent, language is still a barrier within businesses, instead of an enabler to do business. As Bill Sullivan from IBM has said in an interview[19], the purpose of such a collaboration is to provide multilingual enablement in both external as well as internal applications in businesses: from eSupport, FAQs, blogs and community generated content, to email, chat and intranet portals. Such problems are currently solved by businesses mandating the use of English as the lingua franca, but this could be construed as a form of discrimination for some employees, who may well have more to offer but may lack the English language skills to do so and thus be disadvantaged in their company. This is also against a society of multilingualism which I believe is the core of democracy, as it promotes the slow extinction of lesser used languages instead of supporting them, and it also creates a barrier for best business practices. In the same interview Bill Sullivan makes a very important point about how critical it is to really know the machine translation tools you have at your disposal, so that you can apply critical thinking in decisions as to when, how and on what to use such machine translation solutions.

In the audiovisual industry, there is more content that is *not* made accessible than the content that is, and the same happens in global corporations, that can only afford to translate their mission critical information, which represents only a small subset of their content. Information is exploding in global businesses to the extent that traditional translation companies cannot cater for the demand and have to look to solutions other than the machine translation solutions that are already available. The same is happening in the audiovisual industry. Content is exploding there as well, so much so that it is surpassing our ability to provide language solutions with human translators alone. But this does not eliminate the need for skilled translators. On the contrary, the system demands the collaboration of human translators if the result is to be successful where accuracy is important. In fact, such attempts can also expand the translation industry, create new jobs and open up new areas for growth, not take away the jobs that are already available.

In terms of the AVT industry, we are now experiencing the same fears. Subtitlers claim that it is impossible for machine translation to be applied to such a culturally bound product as video or to the translation of oral speech as opposed to written, heavily standardised technical text. They also secretly fear that machine translation will eventually replace them and reduce them to post-editors, and they will be required for lesser pay to correct the 'stupid' mistakes a machine will make, whilst not improving their speed and taking away all the enjoyment of actually translating high profile film productions.

As our company specialises in multilanguage subtitling and we have witnessed first hand all the side effects of the developments in our century, we have tried to look ahead and follow machine translation developments in terms of subtitling. We have reviewed several systems to date (e.g. MUSA, eTitle, etc), even participated in postgraduate re-

[19] Arle Lommel interviews Bill Sullivan (2010) "What's the Deal with IBM and Lionbridge?" *The Globalisation Insider* LISA

search by providing a small amount of parallel corpora for the creation of such a system (Swift Translator[20]), but unfortunately we have not been able to implement any of them to our process for one or more of reasons. And these are:

- Limited number of language pairs provided.
- Not adequate results, mainly due to the lack of corpora the systems were built on, meaning that the ensuing translations would have to be largely re-written and a translator would not save enough time as compared to the time spent doing the work from scratch.
- Further development on the systems being put on hold.
- No easy implementation of the technology in the existing workflows.

It is obvious that without the input of the subtitling linguists any such efforts are due to fail or develop at extremely slow pace, which is what has been happening so far, as the ideas are already there. For example the MUSA project[21] was to create a system that would convert audio streams to transcribed text, then generate subtitles from this text, which would eventually be translated into other languages. This would be an ideal scenario for the subtitling industry, and even if this may still sound like science fiction to many today, it is my belief that it can become a reality soon. Human editors would of course have to be involved at the end of every step of the process to both safeguard the quality of the end product and to provide feedback towards the improvement of these tools. There are already partial examples of such technology in commercial use today. Speech Conversion Technologies Inc (SCTI) is a US company which sells a product called TranslateTV[22]. This tool claims to take US captions broadcast live on American TV and translate them live into LA Spanish for simultaneous broadcast for the benefit of the increasing Hispanic population in the States. Unfortunately a quick view of the samples present in the website shows that the quality of the subtitled output in Spanish is far from ideal and it will be easy for people to criticize such efforts as dangerous and "threatening" to the Spanish language and even the "viewer's brain" (Diaz Cintas 2005: 21[23]). They could therefore delay technological advances instead of looking at them with an open mind and trying to see what innovative parts of them can find applications elsewhere or what further research and development needs to happen for the end result to do justice to the language it serves and to truly fulfil the needs of the intended audience.

In order for ideas such as the above to succeed, large amounts of corpora are needed – especially parallel corpora in the case of machine translation. Such corpora are the IPR of subtitling companies, who naturally would want to protect it from exploitation by their competitors. Therefore a level of trust has to be developed between such com-

[20] Sarrazin, Gregor (2007) *Computer Assisted Subtitle Translation Using Translation Memory*, University of Reading, Unpublished MSc Thesis

[21] http://sifnos.ilsp.gr/musa

[22] http://www.translatetv.com/ttv.php

[23] Diaz Cintas, Jorge (2005) "The Ever-Changing World of Subtitling: Some Major Developments" in *Research on Translation for Subtitling in Spain and Italy*, Sanderson John (ed), Universidad de Alicante, pp. 17-26

panies, software providers and LT experts. Other related issues here would have to do with educating linguists to understand not only what machine translation can do, but also what it cannot do, i.e. infer, assume, read between the lines, etc, so as to be in a position to provide the best feedback possible to software developers. And through this training, these linguists will also be in a position to experience first hand how their daily work could be facilitated by such technological advances. They would then be able to have a say on how these changes would reshape their working lives, by embracing technology, relying on it and allowing it to do the things that would really improve their working lives, instead of fearing it, fighting it and impeding its development.

I believe that machine translation is the last frontier in terms of technological developments in our industry and it will cause another revolution and reshape the profile of the job of the subtitler in the years to come, perhaps to an even larger extent that any change we've seen to date. In my view this is the inevitable future, and any resistance to this will be overcome in the end. Such resistance to change is a mentality issue and it has to do with an innate quality in all humans. However mentalities do and will change and, in the end, those who change first will be the industry leaders tomorrow. In view of this, I represent many subtitling companies that also share my thoughts and beliefs and would like to be prepared for this future and, hence, welcome contributions from LT experts such as yourselves. We recognise that in order for true progress to be made our input is essential, much in the same way that we have worked with subtitle software providers, helping them debug their software through our daily use of it, and asking them to improve on it so as to facilitate and speed up the jobs of our staff. We are willing to cooperate, not only with computational linguistics specialists and technology providers, but also with universities, so that the new generation of graduates is better educated on the technicalities of the business and better able to fit the job profile of the subtitler as this will be reshaped in the coming years.

As a baseline, here is where the AVT industry is today. The demand for subtitles is at an all time high. From the content providers' point of view we are witnessing the following trends:

- Broadcasters are trying to reach global audiences that are multilingual and this presents a challenge for them.
- There is also increasing legislation that creates requirements for subtitling for the deaf and the hard of hearing.
- Content providers in general want to reach the widest audience possible. The rapid increase of internet based video has made it more and more common that subtitles accompany streamed and downloaded content.
- The use of subtitles is also on the increase in public places where the sound is muted or there is lots of ambient noise, such as in gyms and airports.
- Captions are increasingly used by advertisers as well now, in an effort to widen their demographic.
- Finally, subtitles, captions and AD files provide instant metadata for the video asset and add value to it by increasing its 'searchability', which among other things aids its repurposing.

From the viewers' point of view, we are witnessing an increase in the demand for interlingual subtitling, even in countries that are not traditionally subtitling countries, as DVDs have helped make their audiences familiar with this AVT method. We are also witnessing an increase in the demand for intralingual subtitling as a result of legislation and lobbying carried out by organisations representing people with disabilities. It is also interesting that research by Ofcom shows that 6 million out of the 7.5 million users that use intralingual TV subtitles in the UK have no hearing impairment at all[24]. The reasons behind this phenomenon are said to be various, such as[25]:

- Subtitles are used as a means to keep up with TV shows where key plot elements might turn out in an indecipherable piece of dialogue.
- Subtitles provide additional information, such as the name of a song that is being played in the background or its lyrics, which can interest viewers.
- Subtitles become addictive as users get more and more used to them, especially since the advent of DVD.
- Subtitles can even be used to add value to a show, e.g. subtitles in X-factor can make it possible for the viewers to have the lyrics in front of them and thus turn the show to a sing-along event.

In general, with the proliferation of video today, we are witnessing an increase in terms of the available content to which users want instant access, due to a disability such as a hearing or visual impairment, or due to a foreign language element in the video material. Such content is no longer just the product of the entertainment industry. The term 'content' may also refer to corporate videos used for intra-company communication within multilingual companies spanning across all continents. It can also be user generated content, the result of the increase of social media, such as YouTube, Facebook, etc, another sign of our times in which human relationships are changing from local to global.

The increased demand for subtitled content and also the reduced timeframes within which such content needs to be made accessible have created a need companies like us are asked to respond to, and we cannot do that without help from relevant technologies.

- Advanced subtitle technologies are already helping in cutting down the effort and time required when it comes to repurposing subtitles. In order to be able to offer different types of intralingual subtitles on the basis of the needs of the viewers, but also to do this in a cost effective way that could make such an option a reality, a tool would be necessary in order to automatically manipulate text in subtitles on the basis of audio and reading speed information.
- Speech recognition technologies are already making a large impact in the cost associated with live intralingual subtitling, as well as with the timing of off line intralingual subtitles. Speech

[24] Television access services by Ofcom, Executive Summary, 23.03.2006 http://www.ofcom.org.uk/consult/condocs/accessservs/summary

[25] Duffy, Jonathan (2006) "The Joy of Subtitles", *BBC News Magazine*, 31 March 2006 http://news.bbc.co.uk/2/hi/uk_news/magazine/4862652.stm

recognition tools and the re-speaking method also need to be applied to offline captioning and intralingual teletext subtitling in Europe. Also, there is a need for reliable speech recognition tools in more languages than are currently available.

- Scheduling of subtitling and other AVT work, such as AD, needs to be viewed in conjunction. Thus, tools can be developed for using subtitle files as some sort of basis for AD files in terms of timings and in order to facilitate, speed up and lower the costs of the AD process. Also, where AD is delivered in many languages for the same programme material, methodologies and tools could be created so that the English AD version that is typically created first can be used as some sort of 'template' file to aid in the creation of AD scripts in other languages.
- The only area of subtitling that has not been aided by technology as much is origination of interlingual subtitling work and this is where machine translation can make a difference. We have seen some such attempts so far, but the results they have yielded are not satisfactory enough. It is important to build trust between LT experts and subtitling companies as well as individual subtitlers, so that further collaboration is encouraged with the view of providing appropriate feedback and the volume of subtitling corpora necessary in order for technology to yield usable results. Finally, such collaboration can be further encouraged through interdisciplinarity in studies at university level, so that prospective subtitlers can truly understand the technology that underlies their profession but also the inherent potential in other types of technologies, such as machine translation, and how these could be best applied in subtitling.

I would like to applaud your initiative here at META-NET. My intention is to help you achieve your goals through cooperation, provision of information and true communication and I would like to encourage other professionals in my field to do the same.

I also believe that the problems and challenges we are facing in our industry today are not unique. The spread of the internet and social media, and phenomena such as fansubbing and crowdsourcing have an effect that we cannot ignore. The consequences of all this and the problems they create are not unlike those in other professions, as for example in the profession of journalists, whose jobs are also changing due to the increased amount of free news content made available in blogs, through crowdsourcing, etc. Globalisation and digitisation are reshaping the very way we work and live our lives. And if we are involved in how this happens, we can have a say in what works best for us. And above all we have to realise that the century that we live in is that of technology and that the generation of our children, or GEN Z as it is called, will live totally different lives, perhaps not unlike what we have seen in sci-fi films of the past couple of decades. I have a two year old that is now talking in sentences and just loves to talk – he tells stories, argues, and of course talks on the phone as well. I was very surprised and then not so to realise that when I would give him the phone to talk to his grandmother he would pick it up and say, "come on grandma, let me show you the new toy that so and so got me yesterday, here it is" and would take it to his room with him to actually show her what he was talking about. He is born among technology, and tools that would

probably make children of my generation initially scratch our heads are totally natural to him. We see all the time that kids today expect more than the technology we already have available in our home – such as a phone with video conferencing abilities which is still not the appliance you will find in an average home. It amazes me that he also finds it just as natural to 'draw' on a iPad as to draw with a pen and paper.
So here is our challenge in the audiovisual industry. We need your help to overcome our challenges and it is clear to me we need to cooperate with you in finding ways to do that. It is time for more communication and collaboration. Let's work on it together!
Thank you.