VRIJE UNIVERSITEIT BRUSSEL

Master Thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in het Vertalen

Using Machine Translation for Translation and Audiovisual Translation, a Casestudy

Diede DE VUYST

0546237

Academic year 2020-2021

Promotor: Martine Goedefroy

Jury: Jean-Paul WALRAEVENS

Letteren en Wijsbegeerte

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Abstracts

English

This thesis researches the use of machine translation for the translation of text and audiovisual translation. It investigates whether machine translation can be used autonomously, where its strengths and weaknesses lie, and how other tools or practices can be useful in the translation process. The predictive hypothesis is that machine translation can solely be considered a translation aid as it cannot produce a translation of the same quality as a translation carried out by a human professional translator. To investigate this, a literary review, a practical experiment, and an observation during an internship at a translation agency are implemented to create methodological triangulation. This research has found that machine translation tools make many mistake in terms of language use and transferring the correct meaning in the translation. This means machine translation can only be used as an additional tool and its user must critically analyse its output.

Nederlands

Deze thesis doet onderzoek naar het gebruik van machinevertaling voor vertalingen van teksten en audiovisuele vertalingen. Het onderzoekt of machinevertaling autonoom kan worden gebruikt, wat de sterktes en zwaktes zijn en hoe andere tools of gebruiken nuttig kunnen zijn in het vertaalproces. De predicatieve hypothese is dat machinevertaling uitsluitend kan worden beschouwd als een vertaalhulpmiddel en dat het niet zelfstandig een vertaling kan produceren van dezelfde kwaliteit als een vertaling die werd uitgevoerd door een menselijke professionele vertaler. Om dit te onderzoeken wordt gebruik gemaakt van een literatuurstudie, een praktisch experiment en een observatie tijdens een stage bij een vertaalbureau om methodologische triangulatie te creëren. Dit onderzoek is tot de conclusie gekomen dat machinevertalingen veel fouten bevatten op vlak van taalgebruik en de correcte betekenis weergeven in de vertaling. Dit betekent dat machinevertaling enkel kan worden gezien als een bijkomende tool en de gebruiker moet de uitvoer kritisch analyseren.

Key words (4-10 words): machine translation, audiovisual translation, CAT, translation process, SWOT, translation assessment

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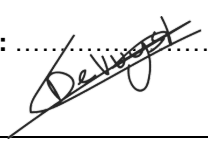
Signature: 

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English summary

For my master's thesis, I carry out research on using machine translation for both the translation of text and audiovisual translation. The aim of this research is to explore, describe, and evaluate this translation tool to find an answer to the main research question: is machine translation applicable to autonomously translate texts and audiovisual segments? By combining three different methods – a literary review, a practical experiment, and an observation during my internship – the aim is to implement methodological triangulation to be able to come to a conclusion that is well-founded. To examine machine translation for text and audiovisual content a division is made between these two translation branches to properly carry out in-depth research per branch which is then brought together to compare the results and draw a conclusion.

By comparing how machine translation is used for the two translation branches mentioned above, it quickly becomes clear that the tool works in very different ways, depending on what kind of content needs translating. This is because for the audiovisual translation an extra layer of complexity is added as spoken language needs to be converted into written language before translation whereas for the translation of written language this is not applicable. As it is a more complicated matter, scientists have only started investigating it about thirty years ago even though the first research on using machine translation for text stems from the 1930s. In addition to this, not many scientists have ventured to do research on automated audiovisual translation which is why this practice is still underdeveloped and very few sources can be found that show practical findings. This lack of research and development makes using machine translation for audiovisual translation a very sophisticated endeavour.

Not only the way machine translation works for the different translation branches differs, but also the mistakes that can be found in its output. When evaluating the machine translation of text the following main issues were found: consistency, meaning, and fluency. For the audiovisual translation, the tool had more problems in regard to interpreting the spoken language correctly and completely, and producing well-written and grammatically correct subtitles. This was mainly due to the nature of spoken language, which is more colloquial and often contains linguistic structures that are not acceptable in written language and therefore need to be rephrased in the subtitles. In general, machine translation seemed to have issues in both translation branches with producing well-written language that could have been written by a native speaker. All these mistakes machine translation tools tend to commit show that machine translation can to this day not be used autonomously and the interference of a professional and trained translator is necessary to guarantee a translation that is qualitative.

Dutch summary

Voor mijn masterproef doe ik onderzoek naar het gebruik van machinevertaling voor zowel vertalingen van tekst als audiovisuele vertalingen. Het doel van het onderzoek is om deze tool te verkennen, te omschrijven en te evalueren om een antwoord te kunnen bieden op de voornaamste onderzoeksvraag: is machinevertaling in staat om teksten en audiovisuele segmenten autonoom te vertalen? Er worden drie methodes gecombineerd – een literatuurstudie, een praktisch experiment en een observatie tijdens mijn stage – om methodologische triangulatie te implementeren om zo tot een goed gefundeerde conclusie te komen. Om machinevertaling voor de vertaling van tekst en audiovisueel materiaal te onderzoeken, wordt een opsplitsing gemaakt tussen deze twee vertaaltakken om per tak diepgaand onderzoek te verrichten wat dan weer wordt samengebracht om de resultaten te vergelijken en een conclusie te trekken.

Door te vergelijken hoe machinevertaling wordt gebruikt voor de twee vertaaltakken die hierboven worden vermeld, wordt het al snel duidelijk dat de tool op zeer verschillende manier functioneert, afhankelijk van wat het moet vertalen. Dit komt omdat bij audiovisuele vertalingen een extra complexe dimensie wordt toegevoegd doordat de gesproken taal eerst moet worden omgevormd tot geschreven taal alvorens het wordt vertaald, wat voor de vertaling van teksten niet van toepassing is. Omdat het een complexer onderwerp is, begonnen onderzoekers dit ook pas ongeveer dertig jaar geleden te bestuderen terwijl het eerste onderzoek over machinevertaling voor teksten afstamt van de jaren 1930. Daarbij komt nog dat weinig onderzoekers zich wagen om over automatische audiovisuele vertaling onderzoek te doen waardoor het gebruik van deze tool nog steeds onderontwikkeld is en weinig bronnen te vinden zijn die praktische bevindingen aan het licht brengen. Dit gebrek aan onderzoek en ontwikkelingen zorgt ervoor dat het gebruik van machinevertaling voor audiovisuele vertalingen een zeer gesofisticeerde onderneming blijft.

Niet enkel de manier waarop machinevertaling werkt, verschilt naargelang beide vertaaltakken, maar ook de soort fouten die werden teruggevonden in de vertalingen. Bij het evalueren van de machinevertalingen van geschreven taal werden de volgende belangrijkste fouten gevonden: consistentie, betekenis en vlotheid. Bij de audiovisuele vertaling had de tool meer problemen met de gesproken taal correct en volledig te interpreteren en goed geschreven en grammaticaal correcte ondertitels te creëren. Dit is voornamelijk te wijten aan de aard van gesproken taal, wat meer alledaags is en vaak linguïstische structuren bevat die niet worden geaccepteerd in geschreven taal en dus moeten worden hertaald in de ondertitels. Over het algemeen leken de machinevertalingen in beide vertaaltakken problemen te hebben met het produceren van goed geschreven taal die geschreven zou kunnen zijn door een moedertaalspreker. Al deze fouten die vaak

te vinden zijn in machinevertalingen duiden erop dat we vandaag de dag machinevertaling niet autonoom kunnen laten vertalen en dat de tussenkomst van een professionele en opgeleide vertaler nodig is op een kwaliteitsvolle vertaling te kunnen garanderen.

Table of Contents

1 List of tables, figures and abbreviations

1.1 Rubric for translation assessment

		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning						
2	Completeness						
3	Register						
Language							
4	Comprehensible						
5	Reads as a fluent and original text written by a native speaker						
6	Grammar						
7	Spelling and punctuation						
8	Cohesion and consistency						
						Total number of errors	

Words of gratitude

In this section I would like to thank professor Martine Goedefroy for the help she provided during the writing of this thesis.

2 Introduction

2.1 Framework and delineation

This research on machine translation is part of the field of Applied Translation Studies, translation aids to be specific (Munday, 2013). Dating from the 1940s (J. W. Hutchins, 2015), machine translation has evolved to a widely used tool by both professional translators and laypeople. Thanks to several free online machine translation tools (J. W. Hutchins, 2015), laypeople can now easily use these tools which is why many of these amateur translators consider professional translators to be redundant as they think it can be easily replaced by machine translation. Professional translators, on the other hand, use it as a tool, supplementary to their skillset and other tools. Therefore, this research will demonstrate that machine translation cannot simply replace human translators while proving how it can be useful if used properly.

2.2 Hypotheses and expectations

Machine translation has been evolving for several decades (J. W. Hutchins, 2015) and is now more relevant than ever before as the time we live in can be called the digital age. With all these ever-evolving technological advancements come a lot of changes in the translation industry but it is expected that machine translation is not suitable to be used independently. The predictive hypothesis predicts that machine translation, when used autonomously, cannot guarantee the same level of quality as translations carried out by trained professional translators. This applies to both text segments and audiovisual products and it means that machine translation can only be seen as a translation aid to speed up the translation process while maintaining the level of quality by letting a trained professional alter its output.

2.3 Goal

For my master thesis I will be conducting research on using machine translation for translation, audiovisual translation and live subtitling. It will be a case study in which the purpose is to explore, describe and evaluate the use of machine translation with the aim of investigating how it can be used efficiently and where its shortcomings lie. Other technological tools will also be investigated to carry out research on how those tool can be used as an addition to machine translation or how it can offer a better alternative to machine translation. To study the use of machine translation a widely known tool called a SWOT analysis will be used in this research. A SWOT analysis is an acronym that stands for strengths, weaknesses, opportunities, and threats and is mainly used to conduct research on the feasibility of success of companies (Mind Tools, n.d.). However, for this type of research all four

categories will be included in this research with the objective of understanding machine translation as a practice, answer the research question and treat machine translation exhaustively.

The start of the research will be both explorative and descriptive, which means various sources are consulted to outline where machine translation came from and how it was developed to today's version of the tool. Looking back at the history will help to understand what the initial purpose was of machine translation, how it evolved and what it might become in the future. This will help to situate he phenomenon in the future of the translation industry and look at possible threats or opportunities for professional translators. In the next section, the output of machine translation will be evaluated in terms of the quality and will bring to light where its strengths and weaknesses lie. It will help to answer the main question on how machine translation can be useful for professional translators and what its limitations are when used as a tool by a human translator or autonomously. This will answer the question raised by many non-linguists about whether human translators can be considered redundant and whether their jobs are bound to be extinct due to machine translation.

2.4 Outline

This thesis follows a logical order, starting with a description of the methodology used to convey these findings. Three methods will be used and explained in the upcoming section: a literature review, a practical experiment, and an observation. After the methodology all the relevant findings will be treated in the results, divided by the methods used. In the findings there is an exposition of various parts: a description of what machine translation is and what it is not, an account of the evolution of machine translation, a listing of the advantages and disadvantages of machine translation, a listing of the complications related to live subtitling, and a mention of other technology used for translation. After the results the findings are compared and combined in the discussion to answer the initial research questions which will then be summarised in the conclusion. The conclusion also looks back on this research and casts an eye over potential research in the future.

3 Research methodology

3.1 Methods

3.1.1 Literature review

A literature review will be carried out to explore the matter and acquire an insight into machine translation as a phenomenon. This literature review will also help to understand and position the findings of the more practical approaches within a wider theoretical framework. All academic sources are acquired from Google Scholar or the database of the Free University of Brussels (VUB). Most of these sources can be placed in the field of Translation Studies, Didactics, or Computer Science. It will also provide inspiration for where this thesis can fill a gap in all the sources that are currently available. By applying the induction research technique, the literature review becomes part of the methods to gather useful information that is later combined with other data in the results with the aim of forming an all-encompassing conclusion.

3.1.2 Experiment

An experiment is used as a way to obtain an insight into the use of machine translation for translation assignments. A division is made between the audiovisual translation and the translation of a text, both carried out by machine translation. Those translations will then be assessed by using a rubric created by the writer of this thesis, based on various academic sources. This rubric will make it possible to compare the usefulness of machine translation by using the same criteria for all translations. The criteria are divided into categories: accuracy and language use. Accuracy was mainly based on Waddington's method A and C (Waddington, 2001), as these methods are still being used and referred to by lecturers during class. The criteria were then completed by combining various assessment methods described in an article on scoring translations objectively (Khanmohammad & Osanloo, 2009) and my own ideas of what this rubric should cover. All criteria use a five point system, in which one means unsatisfactory and five means excellent. This will help to understand where machine translation makes the most mistakes or where its true capabilities lie. By using the same tool to evaluate all the translations, it will be easier to see where machine translation performs well and where it does not and it will simplify the process of comparing and generalizing the findings. In the first category, accuracy, the translations are rated on the following criteria: correct transfer of meaning, completeness, and register. The second category is language and contains the following criteria: comprehensibleness, reads as an original and fluent text written by a native writer, grammar, spelling and punctuation, and cohesion and consistency. As mentioned before, these criteria will be used to assess both the audiovisual translation and the translation of a text.

The first part of the experiment, the translation of text using machine translation, will be a translation from English to Dutch using the very widely used platform of DeepL. For this section four different articles will be selected from various types: technical-scientific, literary, economic-financial, and legal-judicial text segments. These types can be considered the four mains domains in translation (Cultures Connection, 2020). Rating multiple texts that belong to different domains shows in which domains machine translation can be useful and in which domains it will be unsuitable to then generalize the findings to form a conclusion.

For the assessment of the audiovisual translation, two videos will be subtitled using machine translation: a video in British English and a video in American English. For these translations YouTube's own subtitle generator will be used to create intralingual subtitles. Dutch is one of the languages that YouTube offers for automated translation along with nine other languages (Brown, 2021) but this is only available for very few videos that can be found on the platform. Because of this, intralingual subtitles will be created in English. For the British English spoken segment, a video from the BBC will be used from a show called "Live at the Apollo" which is a stand-up comedy show that has been running from 2004 to date (British Comedy Guide, 2020). For the segment in American English, a video of a stand-up comedy show from Comedy Central will be used, as Comedy Central is a well-known American network with shows featuring the most known names in American comedy.

The main reason why two videos from stand-up comedy shows were selected is because in these shows the speakers often use a natural way of speaking while not focusing on being formal or pronouncing every word perfectly. In general when comparing text to speech, speech seems to be more colloquial or even informal, elliptic, and context-dependent (J. W. Hutchins, 2015) and this seems particularly true for comedy shows. Comedians often also have strong local accents which is especially noticeable while browsing British comedy segments on the YouTube-channel called "BBC Comedy Greats" which is where the shows of "Live at the Apollo" are uploaded to. This might make it harder for the software as it is not considered the perfect language use but it makes the experiment more realistic and practical. Another reason is that there is an abundance of cultural references in these sketches and it is interesting to see how the software copes with these structures.

3.1.3 Observations internship

All the findings that come to light in both the literature review and the practical experiment are then completed, argued or confirmed by my own experiences I will acquire during my internship. During this internship I will have the opportunity to be part of a translation agency and its purpose is to further develop everything I have learnt during my education and test out the waters of what is to come in terms of working as a translator for a translation agency. This six week period will also serve

as a way to gather insights and information on machine translation from a professional translator's point of view to see how it can be used professionally. The company is a Brussels-based agency that offers translation and interpreting services for all types of content. In terms of translation they carry out sworn translations, technical translations, revisions, terminology management and so on. As they have multiple languages the observations can be generalized instead of applying to only one language combination.

3.2 Reasoning

This research provides answers relating to what machine translation is and what it is not, how it was developed and what its evolution looks like, where its advantages and disadvantages lie for both translation of text and audiovisual translation, what complications might emerge when carrying out live subtitling, and what other types of technological tools might be useful for translation. By combining the methods mentioned above, thus applying methodological triangulation, the results will consist of findings that stem from a more theoretical approach combined with empirical approaches. There have been many studies on machine translation but it seems like most of them use a more theoretical approach or date from a few years ago. As technological advancements seem to go quicker than ever before it is important to keep studying machine translation as many software developers aim to create a solution by using artificial intelligence to offer a better performing machine translation tool. Even though this so called neural machine translation still has its problems (Wang et al., 2017), it can still be a very practical tool for professional translators to use. Using all methods above, it will be possible to see whether this really is the case for professionals and how it can or cannot be used as an efficiency-enhancing tool.

4 Results

4.1 Literature review

4.1.1 Description

Thanks to the rapid globalization of the internet, its users expect new information to be available in their own language within a very short period of time after it was published in the original language (Zuckerman, 2008). Because the continuously increasing amount of publications online is often too much for human translators alone, various tools were introduced to lighten the workload of language professionals, who are expected to do more work in less time. Tools such as cloud-based platforms, crowdsourcing, and machine translation were introduced to meet demand and localize content at a faster rate, making it available for a wider audience (Bywood et al., 2017). This was also the case for videos shared on the widely-known platform YouTube that introduced automated translations for audiovisual products in 2008 (YouTube Official Blog, 2008). Machine translation can be described as using a computer as a translation aid to translate a product in a natural language (source language) into another natural language (target language) (Lopez, 2008; Okpor, 2014). Just like with human translators the goal of machine translation is to understand a text and transfer it into a different language by writing another text that is well written and sounds like an original text (Okpor, 2014).

Machine translation can be classified into two main methods: a rule-based approach and a corpus-based approach. The rule-based approach, also called knowledge-based machine translation or the classical approach, means that a human specifies rules in order to let the tool carry out a specific translation process. This can be in the form of dictionaries and other sources of linguistic information about for example the use of grammatical structures. For the corpus-based approach, or data driven machine translation, the expert creates a parallel corpus that has been created by humans so the tool can analyse and compare the files to create useable data. This parallel corpus consists of original texts linked to their translation. Those two methods lead to the introduction of the Hybrid Machine Translation Approach which combines them to take advantage of each method's advantages and limit their disadvantages (Okpor, 2014). All in all machine translation can be considered rather complicated as it is an interdisciplinary subject that belongs to multiple sophisticated fields such as linguistics, mathematics, and computer science (Peng, 2018) which is why it is not an easy feat to create a tool that works perfectly without the interference of a human translator.

4.1.2 Evolution of machine translation

4.1.2.1 Translation of text

The first time some form of machine translation was introduced was in the 1930s when the idea was to create technology that would help to translate words from one natural language to another. At first this technology was very awkward to use as it required a paper tape to store information which made the whole process rather inefficient compared to what we use today. It was then developed to help the American military communicate during the Second World War and received the name “mechanical translation” (Sreelekha et al., 2016). At the end of the 1940s many scientists started doing research on using actual computers as an aid for translating natural language. Those scientists had noticed that the use of electronic calculators had been proven to be efficient in the world of mathematics and wanted to create a similar tool for natural languages. Three different approaches were then created to translate written text from one language to another: translating literally in the so-called direct approach, translating from the source language to the target language with an independent interlingua between the two languages which was called the intralingua model, or a three stage translation called the transfer approach which consisted of following stages: analysis, transfer, and generation. Most of this research was initially carried out in the United States of America and the Soviet Union and researchers often opted for the language combination of English and Russian with the goal being to be able to read texts that were otherwise not understandable for speakers of other languages, without paying much attention to grammar, terminology and general mistakes (J. W. Hutchins, 2015). Despite its many limitations a first prototype of a machine translation tool that helped translate Russian texts was accepted by the American military and intelligence agencies in the 1950s (Sreelekha et al., 2016) and this marked the beginning of machine translation as we know it today.

In the 1960s research on machine translation became more popular and research groups were formed all over the world to study the subject of machine translation (J. W. Hutchins, 2015). Initially machine translation was used mainly with the word-for-word direct translation approach while not paying attention to grammar or syntaxis which made its output very unreliable and ambiguous (Sreelekha et al., 2016). As machine translation seemed to be more complicated, less accurate and slower than human translators, research shifted from autonomously functioning machine translation to machine aids for translators (J. W. Hutchins, 2015). Because of the many shortcomings, governments were advised to stop funding projects on machine translation as it was unclear if machine translation could ever be a well-functioning, efficient, and reliable tool (Sreelekha et al., 2016).

In the 1980s artificial intelligence was introduced as it was believed that improving the quality of machine translation could only come from natural language processing research. During this period

machine translation also became more commercialized thanks to microcomputers and text-processing software that offered cheaper machine translation systems. At the end of the decade developments also helped to make it possible to study translating spoken language. Up until the 1990s machine translation was used mainly by large companies owning mainframe computers to translate texts which were then corrected and revised by human translators in post-editing. Consumers also started utilizing machine translation which was made possible by owning Personal Computers and the translation software, both introduced in the 1980s. This translation software was mostly very consistent with terminology and translated faster than human translators but often made grammatical or stylistic errors which were then corrected by the human translator afterwards. Because this sped up the process, it was a very cost-effective solution for translation, requiring less human input and therefore less time wage. The difference between professionals using mainframe computers and consumers using Personal Computers lies in the purpose of the translation where these latter translators often translated to get the gist of the message whereas the companies used it as groundwork for a translation finessed by a human translator. It is also worth mentioning many, if not all, translators using machine translation during these times were not satisfied with the output it provided and mainly used it as a tool instead of using it autonomously, which was even more the case from the introduction of translation memories in the 1990s (J. W. Hutchins, 2015).

Research on machine translation before the end of the 1980s usually was based on the linguistic rules such as syntactic analysis or lexical rules. At the end of the 1980s the focus shifted to more corpus-based methods due to the disappointing results that came from the rule-based approaches. This corpus-based method compared bilingual corpora to align equivalents for certain structures from the source language to the target language (J. W. Hutchins, 2015). These aligned texts helped to translate structures by comparing it to earlier translated texts (Sreelekha et al., 2016). This is called the statistical approach which uses the parallel texts and structures to learn and translate sentences it has not yet translated before, using the data it obtained from the comparison of the parallel texts (Lopez, 2008). This meant the word-for-word approach was replaced by the sense-for-sense approach (Munday, 2013) by focusing more on the correlations between phrases instead of words, what lead to the introduction of this so-called statistical machine translation. The combination of statistical machine translation and the rule-based approach is considered to be the future of machine translation according to many researchers as combining both approaches could offer the output of the highest quality (J. W. Hutchins, 2015).

4.1.2.2 Translation of speech

The translation of speech, and thus audiovisual content, started being studied at the end of the 1980s but this type of translation comes with additional challenges such as the differences in voice

input but also the nature of spoken language. Natural spoken language can be considered to be more colloquial or even informal, elliptic, and context-dependent which is harder for the machine translation tool to comprehend and process than written language. Therefore, the use of machine translation for speech started with translating business communication as it was often more formal and structured but in the last decade translating more spontaneous oral language use with machine translation has been the subject of the work of many researchers. These well-working commercial machine translation tools for speech still are a thing of the future due to the many challenges it encounters (J. W. Hutchins, 2015).

4.1.2.3 Analysis of the evolution

Since the beginning of the 1990s the unrevised output of machine translation is used more and more often and turned into the main form of translation for the general public as there are many machine translation tools available online. The most popular language that is translated from and to using machine translation is English, which is most often in combination with Spanish or Japanese but also many other European, African, and Asian languages (J. W. Hutchins, 2015). There are several theories about the evolution of machine translation with one of those theories being Gartner's "hype cycles" (Sreelekha et al., 2016). This model explains the evolution of technological advancements in a chronological order starting with the Technological Trigger in which new technology is conceptualised (Wigmore, 2013). For machine translation this translates to the 1930s in which the initial research on the phenomenon was carried out (Sreelekha et al., 2016). This first staged is followed by the Peak of Inflated Expectations during which the technology receives a lot of publicity about both its perks and downsides (Wigmore, 2013), which for machine translation happened in the 1940s and 1950s, when more and more scientists started showing interest for the tool (J. W. Hutchins, 2015). The third stage is called the Trough of Disillusionment and stands for a decline in interest or funding due to the disappointment in the technology (Wigmore, 2013), which also happened in the United States of America in the 1960s for machine translation (J. W. Hutchins, 2015; Sreelekha et al., 2016). The fourth stage is the Slope of Enlightenment in which the potential of the tool is more widely understood and more companies show interest in the new technology. This stage happened in the 1980s for machine translation as both companies and consumers started using the tool (J. W. Hutchins, 2015). The last stage, and the stage that machine translation is currently in, is the Plateau of Productivity and this is when the technology is used and its applications are understood (Wigmore, 2013). This does not mean machine translation has already reached it pinnacle but it tells us the tool is widely used and accepted.

4.1.3 Advantages and disadvantages of machine translation

4.1.3.1 Advantages

The first use of machine translation is not necessarily one that applies to professional translators but to people learning a foreign language. Foreign language users may use machine translation in many different ways, one of them is using machine translation as a bad model. This means students use translations carried out by machine translation to analyse and correct all errors as an exercise that can be called post-editing. This helps student be aware of subtle language errors and differences between their mother tongue and the foreign language (Nino, 2009). It helps them rework text segments to produce a better end product than what machine translation can offer today.

Many other advantages of machine translation come to mind for both professional translators and laypeople that can be considered obvious to many. For instance, machine translation tools that are widely available online and are commonly and easily used - and often free of charge - let their users create an immediate translation from and to various languages (Nino, 2009) for translations that only need to offer the general meaning of the text (Peng, 2018). This means the translation is not publishable but does offer the ability to understand the text that was originally written in an (unknown) foreign language. Those tools seem to perform well especially when translating strictly lexical items or simply-structured text segments (Nino, 2009). Machine translation can also – often in combination with computer-assisted translation tools – speed up the process for translators, making them work more efficiently and letting them carry out more translations than when translating manually (Peng, 2018).

4.1.3.2 Disadvantages

The first disadvantage of machine translation is especially applicable to foreign language learners and can be seen as the other side of the coin of the first advantage listed above. Many students use free machine translation tools that are available on the internet but are unaware of the shortcomings of the tool. These tools rarely offer the option to set values for the translation such as the type of text that needs translating and its purpose. Foreign language learners, especially those that have a poor level of the foreign language, tend to rely too much on those free translation tools resulting in poorly written assignments or not getting the correct input during the learning process (Nino, 2009).

One of the biggest downsides of using machine translation for other goals than teaching is the quality of the output it provides. Even though such tools perform well when translating simple segments and lexical items, it often makes mistakes in terms of translating too literal, meaning it does not take into account the context, expressions or figurative speech. Besides that, it struggles with

cultural references, producing well-written natural language, and grammar, mainly in terms of verb tenses, modes, and forms (Nino, 2009). While using machine translation it is also noticeable that besides having issues with portraying the correct meaning of certain ambiguous words or structures, it also struggles with specific or technical vocabulary which is why some translations look more like the source text than an independently written text (Peng, 2018). Another disadvantage is that it still needs a lot of input from human translators for all approaches – the rule-based approach, the corpus-based approach, and Hybrid Machine Translation – making it an expensive endeavour (Okpor, 2014). When comparing machine translation to human translators there is a large difference between the two on how cultural references are processed. Human translators often know about cultural conventions or connotations and they can tackle translation problems like this by adding information to the translation or implementing any other solution whereas a computer does not understand culture and will therefore neglect the importance of cultural references (Peng, 2018).

4.1.4 Complications live subtitling

The subtitling industry also tries to implement some form of machine translation into their line of work. This is especially the case when translating audiovisual segments that need translation in a live setting where a combination of computer tools, interpreting, and translation is used (Dawson, 2019). A great example of interlingual live subtitling comes from for instance the live press conferences that are broadcasted in Belgium during the corona pandemic to announce new measures or the relaxing of measures. During these live press conferences Belgian politicians elucidate the new rules and report on the current situation in two of the three official languages of Belgium: French and Dutch. Besides showing a person expressing the given messages through sign language in the corner of the screen, interlingual subtitles are provided. This means that for example when the politicians are speaking French, the subtitles provide the meaning in Dutch and vice versa. As these press conferences are being broadcasted in a live setting, subtitles need to be created rapidly while still offering a qualitative translation. This is where automated tools can be useful to help the audiovisual translator work faster and more efficiently while the subtitles maintain a sufficient level in terms of quality.

In many cases when subtitling live events, a slight delay of the written subtitles can be noticed, compared to the audio is represents. Because translators try to limit this delay mistakes are made very easily, resulting in low-quality subtitles that can affect the overall comprehension of the audiovisual product (Piñero & Cintas, 2015). Translators carrying out audiovisual translation can use speech recognition software to repeat or paraphrase what is heard in an audiovisual product (Dawson, 2019) such as movies, news broadcast or any other type of video. This software turns the spoken language into written text, which can then be used as subtitles or as a base to create interlingual subtitles (Dawson, 2019). Using this technique to carry out intralingual live subtitling is known as “real-time

captioning" in the United States of America and is considered a very challenging process as errors and delays cannot be avoided. Intralingual live subtitling is mostly used as a real-time transcription of what is being said by viewers who are deaf or hard-of-hearing (Romero-fresco & Pöchhacker, 2017) but it can also be used for language learners who are not perfectly fluent in that language yet. Another option is to have someone interpret the spoken language live to then use this output in combination with speech recognition software to create the interlingual subtitles. This is called interlingual respeaking and is a fairly new practice in the translation industry whereas intralingual respeaking – from speech to text in the same language – has been used for the past twenty years (Dawson, 2019). Nowadays intralingual respeaking is considered to be the preferred method for live subtitling in most countries around the world (Romero-fresco & Pöchhacker, 2017). As interlingual respeaking is a rather new phenomenon and it is still in its early stages, the output is not satisfactory yet in terms of quality and still needs more research and practical experiments to evolve into a reliable and efficient way to carry out audiovisual translation (Dawson, 2019). Therefore it is not suitable yet to use this type of tool for live audiovisual translation when the aim is to produce an error-free and complete translation without the input of a professional translator.

As mentioned before, the output of respeaking in unsatisfactory due to the many mistakes and delays it produces. It was introduced in Europe in 2001 but because subtitling companies in various countries applied different strategies due to the lack of research, the methods differ greatly when comparing the practice of different countries. In some countries the respeaker corrects their own mistakes on screen whereas in other countries a team is formed to divide the different tasks between three to four people, where one person respeaks and the others alter the output before it is shown on screen. Even though this practice has been used for twenty years, academic research is still scarce to the extent that it takes up less than one percent of all publications on audiovisual translation. In recent years respeaking has become more popular to translators and scientists, resulting in an increase of research on this topic. Thanks to globalization, the demand for interlingual live subtitling has grown with different methods rising in Spain, Wales, and Flanders. In Spain, bilingual stenographers are put into service to transcribe and translate audio rapidly from English into Spanish. In Wales, a team of an interpreter, a subtitler, and a respeaker is formed to translate from Welsh to English. In Flanders, the interlingual translators use an antenna delay to allow to correct and edit the subtitles before they are broadcasted on screen. Due to the lack of research, it is unknown which method is more efficient, how these translators should be trained, and how quality assessment of the subtitles should be carried out (Romero-fresco & Pöchhacker, 2017).

In Flanders, the broadcasting channels are obligated to offer intralingual audiovisual translation for viewers who are deaf or hard of hearing. This lead to the national broadcaster of the

Flemish part of Belgium (VRT) developing a platform to offer support from speech and language technology to lighten the very labour intensive subtitling process. The aim was to build a platform that combines multiple speech and language technologies, such as machine translation and software that learns automatically so its output gets better the more it is used, also known as artificial intelligence. To maintain the high level of quality, the intention of this tool was to support translators and not replace them by the tool. During the experiment, the tool showed its potential when translating scripted segments such as news broadcasts but showed inconsistencies when translating more spontaneous speech or dialectic language use (Doulaty et al., 2016).

4.1.5 Other technology used for translation

4.1.5.1 Translating text

Translation technology plays a considerable role In today's translation industry and ended the times of translating on paper (Krüger, 2016) by introducing tools that boost the efficiency and working pace of translators doing their job. As this sector sees a rise in project complexity and specialization, technology was bound to offer a solution to cope with these developments in the industry (Rodríguez-Castro, 2018). Therefore, especially for translating text, many if not all translation agencies require staff that has knowledge of working with translation memories and have been trained to use computer-assisted translation (CAT) tools (Krüger, 2016), also known as 'translation workstations' (J. Hutchins, 2003). As the employers seek professionals that know the ins and outs of this type of technology, a refinement of the translation curriculum was needed to integrate graduates in the industry more easily. As the language industry has been growing over the last thirty years and clients require a rapid turnaround with tight deadlines of often rather complex translation assignments, translators need to offer employers or clients an extensive skillset of which CAT tools are a large part (Rodríguez-Castro, 2018). The reasons why these CAT tools, and therefore translation memories and term bases, are widely used are to increase the standardisation of the translation process, improve productivity, offer cross-document consistency, and lower translation costs (Krüger, 2016; Rodríguez-Castro, 2018). It also does come with risks: the focus from the translator can shift from the entire text to the individual segments the text has been divided into, and the quality of the translation memory can have an negative impact on the finalized translation when this translation memory is of poor quality. The overall usability of a certain CAT tool is also something to pay attention to as a poorly developed tool might decrease the positive effects and therefore have a negative impact on the translation process (Krüger, 2016).

Other tools that are not necessarily part of the translation are these so-called writing assistants. These tools are automated and are available online, sometimes for free and sometimes it is linked to research centres or universities. The aim of these tools is to scan your text for mistakes in

terms of for example grammar, language use, and the complexity of the text. For this to work most of these tools work in the same way: you copy your text to the website or computer application to then search for possible mistakes. In the translation process this can be implemented in the last stage, to proofread the translation and revise it one last time. For translations to English two options come to mind: the Hemingway Editor or the Academic Writing Assistant (AWA) which is developed by the Catholic University of Leuven (KUL). The latter offers this service for both English and Dutch and requires login details of a student or employee of the KUL or an account that was provided by KUL. There is a difference between the aim of those two tools: the Hemingway Editor focuses on using clear and comprehensible language (Hemingway Editor, 2021) whereas the AWA tool focuses on academic language use (AWA Schrijfhulp, n.d.). As the purpose of these tools differ greatly, it is important that those who want to use such a tool are aware of what they are using the tool for. To scan Dutch texts for mistakes AWA can be used if you have an account or you can use the free-to-use Schrijfassistent which is made available by KUL, the Flemish radio and television broadcasting organisation (VRT) and the Flemish newspaper De Standaard. The latter option aims to correct mistakes in terms of spelling, writing style, and offers tips and tricks related to language use (Schrijfassistent n.d.). It must be mentioned that these tools offer a solution for small grammatical mistakes and are unable to provide feedback on the actual content or the meaning of certain structures. Another option is to use word-processing software such as Microsoft Office Word – which most language professionals have access to – to check for the same types of grammatical mistakes such as punctuation or capitalization.

4.1.5.2 Translating audiovisual content

Partly thanks to the European legislation which prescribes to make multimedia content available to all, the amount of subtitling assignments has skyrocketed over the years (Álvarez et al., 2016). With the EU's Audiovisual Media Services Directive (AVMSD) being finalized in November 2018, it supplied audiovisual translators with more work as all forms of content were incorporated in this directive, from online videos to news broadcasts (Directive (EU) 2018/1808 Of The European Parliament And Of The Council, 2018). Furthermore, thanks to the rapid globalization, subtitles are becoming more popular every day for non-native speakers with limited knowledge of a certain language to be able to understand (online) content in which an accent or the speed of speech is too hard to understand (Piñero & Cintas, 2015). In order to meet the growing demand, the industry has been seeking alternatives to help speed up the translation or transcription of such content instead of doing everything manually, which takes up between eight and ten times as much time as the length of the segment that is being subtitled. Therefore, many forms of speech recognition software are used to offer the audiovisual translator a basis after which the subtitles are altered wherever necessary

using a technique called post-production (Álvarez et al., 2016). The techniques using speech recognition software are described in section 4.1.4 and often make use of respeaking and interpreters.

Besides those tools, audiovisual translators tend to use some sort of computer programme such as Subtitle Workshop or Aegisub to easily carry out the spotting and translating of the audio (Talaván & Ávila-Cabrera, 2021). Using this type of software helps the translator to simplify the translation and spotting, to comply with the rules for subtitling such as the amount of characters and duration of a subtitle, and to avoid making translation errors. Aegisub is a frequently used tools by amateur translators - thanks to its simplicity, user-friendliness, and because it is a free tool - and is also used by lecturers to teach students the basics of both intralingual and interlingual subtitling (Basari et al., 2017). Furthermore, translators sometimes receive a template from the clients that consists of a subtitle file in which the subtitles in the source language are already created and spotted and the file comes with the specific settings in terms of the formal elements such as the amount of words per second. This template can also be a 'blank template' or a 'masterfile' that consists of only the spotting without containing any text. Templates can help the audiovisual translator to speed up the process by eliminating the task of spotting but this is only true when the template is created properly, the timing is impeccable, and the subtitling conventions or rules are the same in the source language and the target language. Supplying a template is most often done for content that needs to be translated to multiple languages as a way to cut costs by supplying all translators of all languages with the same template. It should be mentioned that these templates are most useful when the translator can use it as a basis and is allowed to alter the segments if needed (Piñero & Cintas, 2015). Audiovisual translation seems to still lack more alternatives when it comes to specific tools that speed up the translation process other than the ones mentioned before, especially for interlingual translation, as it seems to be a very complicated matter to transform the spoken language into properly written language in another language without the interference of a human translator. In recent years it has received more attention of academia (Talaván & Ávila-Cabrera, 2021), which might lead to rapid developments soon.

4.2 Experiment

4.2.1 Description

For this part of the results the free online translation tool DeepL will be used for the translations of text and YouTube's own automated subtitling software will be used to assess the output of the tool. As mentioned before, a division will be made between the translation of text and the translation of the audiovisual content. For the first part, the translation of four different text types will be carried out by DeepL to see how it performs for all four text types: technical-scientific, literary,

economic-financial, and legal-judicial. All texts were selected on the basis of the credibility of the source and a word count of between 1000 and 2000 words. The translation will be carried out from English to Dutch as this language combination is offered by DeepL and the writer of the thesis is a Dutch native speaker that would always carry out translations or revisions with this language combination. For the assessment of the automated subtitles, intralingual subtitles are evaluated because YouTube only offers interlingual subtitles for some videos and when trying this function, it quickly became clear these interlingual subtitles were not useable as it consisted of too many mistakes.

For the technical-scientific translation an article on space travel is selected from the website of National Geographic as the language is rather formal, specific terms related to space travel are used, and the choice of words is typical for this text type. For the literary translation, a short story was selected that was posted on a blog called Reedsy which is mainly dedicated to short stories on which it won the weekly writing contest in March 2021 and is called “Seconds ‘til the revolution”. For the economic-financial translation an article from the international edition of The Guardian was chosen with the title “Your new (tax) year resolution … give your finances a spring clean” as it uses typical structures for this type of text but also metaphors and other figurative language. Finally, a sales agreement was selected for the legal-judicial translation as it contains fixed expressions and structures often associated with this text type.

As mentioned before, for the second part of the experiment two videos will be subtitled: one in British English and one in American English. The subtitles will be in English as YouTube does not offer interlingual auto-generated subtitles for all videos yet. Some videos do offer this possibility but after looking into this function, it was clear the interlingual machine translation tool was unreliable and far from useable for this study. For the British English video a segment of the stand-up comedy show “Live At The Apollo” was chosen in which Mo Gilligan performs in front of a crowd (BBC Comedy Greats, 2020). Mo Gilligan has been nominated as “The Funniest Man in Britain” by The Times and has become immensely popular by performing all over Britain, winning important prizes, and having his own shows on both television and streaming platforms (Mo Gilligan, 2021). While he is a well-known comedian, just like his humour, his accent is typically southern British which might make it harder for the subtitle generator to create subtitles. The video for the subtitles of the American English segment is a of the performance of Iliza Shlesinger from 2015, posted on the YouTube channel of Comedy Central (Comedy Central, 2015). With shows all around the world, multiple Netflix specials and many prizes to her name – she won the NBC’s Last Comic Standing as the only woman and youngest comedian – she is an established comedian, both in the United States of America and overseas (Greenhoustalent, 2021). To be able to compare the two segments, the findings of both videos are

limited to the first four minutes of the segment, concluding with the end the last sentence the comedians are saying at the four minute mark.

4.2.2 Assessment

For the assessment of the translations of text, each source text is translated by DeepL after which they are divided into segments to properly compare the source text with its translation. These segments are then placed in a table consisting of two columns – the source text can be found in the left column with the translation beside it in the right column – after which the translation is revised to mark the mistakes that were made by the machine translation tool. For this revision a colour system will be used to mark the mistakes according to categories of the rubric that were mentioned before. In this system the colour red will highlight mistakes in terms of accuracy and the colour yellow will show language mistakes. Behind the marked errors a number between brackets can be found that shows what kind of mistake it is, according to the numbered subcategories of the rubric. All errors accompanied by a number between brackets are counted and accounted for in the rubric while errors that are not followed by a number have been already marked elsewhere in the text but because it is the same mistake, it is only counted once. Accuracy errors can consist of changes in meaning, incompleteness, and mistakes concerning register. Language mistakes can be in terms of comprehensibility, not sounding idiomatic and therefore not being conceived as a text written by a native speaker, grammar, spelling and punctuation, and cohesion and consistency. After all mistakes are highlighted it will be used to score both categories of the rubric according to the number of errors per subcategory and the seriousness of the errors committed.

For the evaluation of the audiovisual translation, the same rubric will be used with the same categories and subcategories to count the amount of mistakes that were made. While watching the videos all mistakes will be listed in a three-column table in which the type of mistake is listed along with what the speaker actually said and how it was converted into text by the software. This list of mistakes will then be used to fill out the rubric and score the performance of the automated subtitles.

4.2.2.1 Translation of text

After comparing the results it is noticeable that DeepL mainly had issues when it came to transferring the correct meaning of the source text to the target text. For all text types, when looking at all the subcategories, this subcategory counted either the highest number of errors or the second highest after the problems regarding fluency and the translation sounding like an original text written by a native speaker. When looking at the averages, those two subcategories proved to be the most challenging for DeepL's machine translation software even though mistakes were found in all but one subcategory when evaluating the translations of text. For this experiment the comprehensibility of the

translation was never an issue but the reader of the translation would sometimes not receive the exact same information due to small differences in nuance, a poor choice of words or sentences that were rephrased poorly and thereby changed the meaning of the original text. The overview of all the mistakes that were made are listed in the next section, split up and listed per text type. When comparing the different text types it is clearly visible that DeepL struggled most with translating the legal-judicial text and had the least issues with the technical-scientific text. Even though these are the texts with the most and the least words respectively, the worst text has only 776 more words – which is 43.42% more – than the best translation but the number of errors is multiplied by 3.82. In the table below, it is clearly visible where DeepL comes up short and does not perform well in general, regardless of the text type it translates.

TOTAL		**Total number of errors**	**Average number of mistakes per text**
Accuracy			
1	Correct transfer of meaning	32	8
2	Completeness	5	1.25
3	Register	1	0.25
Language use			
4	Comprehensible	0	0
5	Reads as a fluent and original text written by a native speaker	28	7
6	Grammar	2	0.5
7	Spelling and punctuation	21	5.25
8	Cohesion and consistency	8	2
TOTAL		97	24.25

4.2.2.1.1 Technical-scientific translation

The source text that was used for the first part of the experiment on using machine translation for translating text was sourced from National Geographic (Bennett, 2021) and counted 1,011 words. When looking at the evaluation of this technical-scientific translation three specific issues are clearly noticeable. The first one is the fact that DeepL sometimes tries to rephrase sentences by changing the word order but by doing so it changes the meaning of the sentence. An example of this is the following sentence: “The space agency’s small helicopter, called Ingenuity, has been deposited…” that was translated as “De kleine helikopter van de ruimtevaartorganisatie, Ingenuity genaamd, is neergezet…”. In the original sentence the name Ingenuity refers to the name of the small helicopter whereas in the translation it refers to the space agency. By moving the nonrestrictive clause (“called Ingenuity”) in the sentence, the meaning of the sentence has clearly changed. The second issue when translating this text was that DeepL translated too literally, especially when translating idioms such as “to pave

the way". A last issue that arose was that ambiguous words were not translated correctly due to not taking the context into account or paying attention to the general theme of the article. This resulted in some words having been translated correctly when purely looking at the term but in that sentence the translation did not make any sense.

TECHNICAL-SCIENTIFIC TRANSLATION		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	6
2	Completeness			X			1
3	Register	X					
Language							
4	Comprehensible	X					
5	Reads as a fluent and original text written by a native speaker		X				2
6	Grammar	X					
7	Spelling and punctuation		X				2
8	Cohesion and consistency	X					
Total number of errors							11

4.2.2.1.2 Literary translation

The short story that provided the material for the evaluation of a literary translation counted 1,055 words, was called "Second 'til the Revolution" (Medina, 2021) and was uploaded on a blog in March 2021. Overall, it showed quite a few translation errors with the most problems showing up in the subcategories concerning transferring the correct meaning and the translation reading as a fluent and original text written by a native speaker. Furthermore, specific problems applied to this text other than the translation being too literal and neglecting the context or certain nuances linked to words in the source text. One issue was the misuse of the past tenses in the target text in Dutch which changed the meaning and therefore the storyline of the narrative. The software also left out information by shortening a sentence which resulted missing a key part in the target text that was needed to understand the first part of that sentence. "The palms of his hands had still been bright red from where his teacher had brought down the ruler with a vengeance." was translated as "Zijn handpalmen waren nog steeds knalrood van de wraakactie van zijn leraar.". In this translation the ruler that caused the red hand palms was left out and replaced by an "act of revenge" which eliminates the link to the red hand palms.

LITERARY TRANSLATION		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	8
2	Completeness		X				2
3	Register	X					
Language							
4	Comprehensible	X					
5	Reads as a fluent and original text written by a native speaker				X		8
6	Grammar		X				2
7	Spelling and punctuation	X					
8	Cohesion and consistency			X			2
						Total number of errors	22

4.2.2.1.3 Economic-financial translation

For the economic-financial translation an article with a word count of 1,127 was sourced from the Money section of the website of the international edition of the Guardian (Hickey, 2021). For this text there was once again an issue with translating too literal and changing the meaning of a sentence by rearranging the word order. Another problem was that DeepL sometimes did write abbreviations from the source text in full in the target text and sometimes it just copied the abbreviation in the translation. For the target audience, those abbreviations are not common and will therefore not be understandable by that audience. This could have been avoided by writing the non-abbreviated version or adding information to tell the reader what it stands for. Unfortunately, DeepL often was not able to do this on its own. A last problem that only this text seemed to have is the lack of gender neutral language use. The following sentence: “This means anyone close to the thresholds could be tipped over if their wages go up” was translated as “Dit betekent dat iedereen die dicht bij de drempels zit, erover kan vallen als zijn loon stijgt”. In this text the translation opted for the male version of the possessive pronouns instead of avoiding such constructions or using a more gender neutral alternative like in the original text that opted for “their” instead of “his”.

ECONOMIC-FINANCIAL TRANSLATION		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	6
2	Completeness		X				1
3	Register		X				1
Language							
4	Comprehensible	X					
5	Reads as a fluent and original text written by a native speaker					X	7
6	Grammar	X					
7	Spelling and punctuation			X			4
8	Cohesion and consistency			X			3
						Total number of errors	22

4.2.2.1.4 Legal-judicial translation

When selecting a source text for the legal-judicial translation I had first chosen a part of a directive of the European Parliament but as the translation from that text could be found online, DeepL seemed to have taken advantage of that and used the segments of this translation to provide its own translation. This shows that DeepL can recognise a text and link it to an official translation of this text that can be found online. Because this text was not going to offer realistic or useable results, another source text was chosen to guarantee the legitimacy of this experiment. The document used for this translation was a template of an American sales agreement that could be found online as a PDF to be filled out (Legal Templates, 2020) and counted 1,787 words. The word count of this document was higher than the other three but as I wanted to translate the entire document and it contains many repetitive structures, it did not matter. There were two main issues in the translation of this document that were both more problematic in a legal-judicial text than it would be in another text type. The first issue was that some words and structures were translated differently throughout the text, the translation was sometimes correct but often wrong. This meant that for example reappearing clauses were translated differently compared to the initial translation of that segment or some ambiguous words were translated without taking the context into account. This was especially the case for the structure “check one” that was translated as “check one”, “kruis één aan”, “één aankruisen”, “controleer één”, and “controleer er één”. The second option might have been the best one from all the translations that DeepL provided and it is important to select one option and use it everywhere throughout the text to translate “check one”. This is especially problematic for legal documents as the main aim is to avoid confusion and different interpretations. The second problem was the capitalization for which DeepL often copied the use of all caps in the source text and sometimes it translated it in small caps. For this text this happened for the translation of “BOTH” that

was translated as “Zowel” and by not capitalizing the word in the translation it lost its emphasis that was clearly important in the source text. It also capitalised words in the translation that were capitalised in the source text but this is not done in Dutch and therefore a mistake. All the names of the parties that are involved in the agreement are written with a capital letter in the original text but translating words such as “Buyer” and “Seller” as “Koper” and “Verkoper” when the word is not the first word of the sentence is incorrect in Dutch.

LEGAL-JUDICIAL TRANSLATION		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	12
2	Completeness		X				1
3	Register	X					
Language							
4	Comprehensible	X					
5	Reads as a fluent and original text written by a native speaker					X	11
6	Grammar	X					
7	Spelling and punctuation			X			15
8	Cohesion and consistency			X			3
						Total number of errors	42

4.2.2.2 Audiovisual translation

While evaluating the auto-generated subtitles it quickly became clear where the most concerning issue of the software lies: punctuation and capitalization. In both videos no punctuation was applied and only in the segment in American English a few capitalized words were displayed on screen. Due to this lack of punctuation marks and capitalized letters the biggest problems were the fourth subcategory of the rubric, comprehensibility, and the seventh, spelling and punctuation. Because the software is unable to detect the beginning and the ending of sentences to insert punctuation or capitalized letters and the personal pronoun “I” was mostly not capitalized, the output was confusing, especially for viewers that would not be able to hear the audio. Just like with the translation of text, another big problem for both videos was transferring the correct meaning from the source text to the target text. This is remarkable as even though these were intralingual subtitles, the software often interpreted words in a very different way, resulting in sentences that were either different in meaning or did not make any sense at all. It is noticeable that the audiovisual translation tool had more issues with the overall comprehensibility of individual sentences and not omitting parts of what is being said, compared to the machine translation tool for text. As it was a transcription of the speech of a native English speaker, there were no issues with the fluency and the transcription reading like an original text written by a native speaker when ignoring the issues in terms of

comprehensibility. The same applies for the subcategory of the cohesion and consistency of the subtitles. Because speech is colloquial and speakers pay less attention to using grammatically correct language and the software only transcribed what could be heard, many sentences lacked the proper use of grammar that is mostly expected from written language. To demonstrate the many mistakes in terms of grammar, spelling and punctuation in the rubrics, the symbol "∞" is used as the software did not implement these subcategories when creating the subtitles. These errors are therefore considered to be infinite, which is why the symbol "+" can be found behind the total in the table below.

TOTAL		**Total number of errors**	**Average number of mistakes per video**
Accuracy			
1	Correct transfer of meaning	26	13
2	Completeness	11	5.5
3	Register	1	0.5
Language use			
4	Comprehensible	8	4
5	Reads as a fluent and original text written by a native speaker	0	0
6	Grammar	∞	∞
7	Spelling and punctuation	∞	∞
8	Cohesion and consistency	0	0
TOTAL		46+	23+

In the tables below, it is clearly noticeable that the number of errors in both segments is more or less the same while the speed of speech is roughly the same in both videos as well. However, in the British English segment, the comedian is known to play different characters and by doing so he uses different voices and language use. In these parts he often mumbles or produces sounds to liven up the story and make them funnier. The machine translation tools was not always able to adapt to these changes, especially when the comedian speaks at a faster pace or at the end of sentences that flow into the next sentence by leaving no obvious break between the two. All in all the two evaluations showed similar results with the exception of the error in terms of register in the British English video. In this video a word of profanity was subtitled as "[__]" instead of the actual word and even though this can be considered a positive adaptation, it is an error in terms of transferring the same register. Whether this adaptation is more ethical than transcribing the word that was used is a different matter altogether but as the word was not censored in the video itself, it is best to transcribe it as such.

BRITISH ENGLISH		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	15
2	Completeness				X		7
3	Register		X				1
Language							
4	Comprehensible				X		3
5	Reads as a fluent and original text written by a native speaker	X					
6	Grammar					X	∞
7	Spelling and punctuation					X	∞
8	Cohesion and consistency	X					
						Total number of errors	26+

AMERICAN ENGLISH		5	4	3	2	1	Number of errors
Accuracy							
1	Correct transfer of meaning					X	11
2	Completeness			X			4
3	Register	X					
Language							
4	Comprehensible					X	5
5	Reads as a fluent and original text written by a native speaker	X					
6	Grammar					X	∞
7	Spelling and punctuation					X	∞
8	Cohesion and consistency	X					
						Total number of errors	21+

4.3 Observations during internship

During my internship it quickly became clear that machine translation was not an integral part of the whole translation process in this company. It was even so that that the practice never came up or was ever discussed. The focus of the company appeared to be on the management and use of translation memories and term bases instead of machine translation. Those tools were used to pre-translate segments but also to offer support during the translation process to translate consistently. In addition to this, the company sometimes supplied their translators with a parallel corpus of previously translated documents to see how specific translation problems were handled. Because these segments do not return in other translations using the same structure, the translation memory cannot identify these segments as similar. This is especially helpful when translating content from one language family to another, such as from French to English or Dutch. A concrete example of this is the use of the gerund in French. As French is a Roman language, and thus stemming from Latin, it still

often uses Latin structures such as a *gerundium*. This makes it hard to translate structures such as “en faisant” to languages that do not belong to the Roman language family. By looking at the parallel corpus, translators can quickly see how such structures have been translated before, creating a consistent translation compared to other work carried out for that client.

Other than using the translation memory and term base, translators were allowed to translate using whatever tool they deemed appropriate. This means translators can use machine translation if they want, but also other parallel corpora if the supplied material is not enough. A tool that was consistently used in this company was a computer-assisted translation tool called Déjá Vu X3. In this software package the translations and revisions were carried out and translation memories were created by translating in the program or aligning previously translated documents. The aligned documents were also used to create term bases per client in Microsoft Office Excel to then be imported in the (translation) projects that were created in Déjà Vu X3. All in all it can be said that this company specifically values their translation memories and term bases more than other technological tools such as machine translation.

5 Discussion

5.1 Evolution

For the past ninety years, machine translation has been evolving slowly from what was a translation tool that was very awkward to use to what it is now. It is important to notice that this technology was first developed to translate written language and that the translation of speech and therefore audiovisual content came later. At the beginning the tool needed a lot of hardware components, making it a rather inefficient process, which was then adapted to be used by the American military during war. After two decades after the initial launch of the tool, scientist started investigating how the tool could be further developed to offer something more useful that could be utilized for natural languages in the same that a calculator was used by a mathematician. The goal was to create a translation aid that could be used during the translation process to offer the translators more support. Three methods were developed: the direct approach, the intralingua model, and the transfer approach. The direct approach translated literally, the intralingua model used an independent intralingua to transfer the meaning from the source text to the target text, and the transfer approach introduced three stages to carry out the translation: analysis, transfer, and generation. American and Russian scientist studied these approaches and machine translation as a whole with the aim of being able to understand a text written in an unknown language without paying much attention to the formal aspects of the languages such as grammar or terminology. After years of research, a tool was developed and used by American intelligence and this can be considered as the beginning of machine translation as we know it today. At that time machine translation did not have much in common with the tool as we know it today and it was only available to government agencies.

From the 1960s the useability of machine translation had been proven and more and more scientists from all over the world started researching this topic. As machine translation was and still is an interdisciplinary topic and scientists had to be specialized in linguistics, mathematics, and computer science, it seemed to be a very sophisticated research subject. Because scientists were focusing on the direct approach – without paying attention to language use – and human translators seemed to be able to create a translation that was both more accurate and carried out quicker, many people were unsure about whether it could one day be possible to offer a well-functioning tool that could help translators significantly. To offer an answer to these doubts, in the 1980s scientists introduced artificial intelligence as it was believed that this was the only way to improve the useability of machine translation tools for natural languages. During this time, thanks to many technological advancements in the world of computer science, machine translation tools became available to more people via microcomputers and text-processing software. Around 1990, computers became more accessible to

both enterprises and consumers which led to machine translation becoming a widely used tool. Around this time, scientist also started looking into the use of machine translation for the translation of speech, sixty years after machine translation was introduced. Thanks to the technical developments, machine translation started showing its potential by performing well in terms of terminology while still needing a human translator to correct grammatical and stylistic errors. During this stage translators used the tool to speed up the translation process or consumers used it to understand texts in foreign languages when accuracy was not that important. As the output of machine translation was still not satisfactory, it was used as a tool rather than something that was used autonomously. To enhance the performance of machine translation tools for text, the corpus-based method was introduced to later be combined with the other approaches to go from the word-for-word approach to a more sense-for-sense approach. This was done by using artificial intelligence to compare source texts to its already translated target texts so the software could translate sentences and structures it had not translated before. The combination of different methods might offer the best results but still needs to be further developed to work autonomously or provide better translations.

As mentioned before, using machine translation to create subtitles for audiovisual content made its debut in research around 1990. It quickly became clear that this would be an even more sophisticated topic than the translation of text due to the nature of spoken language and the importance of the quality of the input. Spoken language has been proven to be more colloquial and it does not consider using proper grammar in the same way as written language which makes it harder to create subtitles that do apply the proper use of grammar. The quality of the audio also plays a huge role when creating automated subtitles as the software picks up all audio and does not always differentiate between background noise and an actual conversation that needs translating. Because the software needs to convert spoken language to written language, another dimension is added to the already complicated stages of machine translation.

5.2 Usefulness and shortcomings of using technological tools

When using machine translation in a professional setting, many advantages and disadvantages come to mind which shows why machine translation clearly has its followers and opponents. This is also noticeable at university as some of my lecturers or fellow students swear by using machine translation while others diminish the usefulness of such tools. The way machine translation is used differs greatly from the type of translation it is used for. For the translation of text the results show that machine translation tools can offer a solution for translators to carry out translations more quickly to meet the rise in demand of (online) documents. Those translators that are used to carrying out the task of post-production might speed up the translation process for some

texts as most words and structures are already translated by the tool and therefore they do not always need to be searched for in other sources. It is required that the translators using this technique must be familiar with the terminology and overall theme of the text to be able to properly edit the translation and revise it in a scrupulous way while being very detail-oriented. If the translator can successfully do that, using machine translation can offer the ability to translate at a faster rate while maintaining the appropriate quality standards, making the original text available to a wider audience. This will also lead to a more affordable option for translation as less time will be spent on the actual translation. When laypeople use machine translation it is often in a non-professional setting and the aim is to understand a text or an audiovisual product they would otherwise not understand. In this case lower quality standards are applied as the purpose of the text is not to publish it or use it for professional purposes but to simply get the gist of the content.

5.2.1 Translation of text

As all trained translators know, the output of machine translation tools often leave a lot to be desired. This means the output of content it translates is often of poor quality due to the lack of human interference, resulting in errors of all kinds. The errors the tool has the most issues with are often those that need a human translator knowing about translation customs. Examples of this are expressions, figurative speech, cultural references, ambiguous words, and translating too literal. Even though the tool often knows about grammatical rules, it still makes mistakes regarding producing well-written natural language that sounds like an original text, or extracting the meaning of a certain structure in the source text to translate it properly in the target text. These problems are often present in all text types but it is noticeable that it commits certain errors more often in certain text types or certain errors are considered to be more problematic in certain text types. The text type that machine translation tools such as DeepL have most problems with is the legal-judicial type. For this text type it is very important to apply the conventions of the source language such as the use of capitalized letters, to be consistent throughout the text and translate returning structures the same way, and to rephrase sentences as the archaic language use in the source text often applies a different word order than in the target language. Errors in terms of transferring the correct meaning from the source text to the target text and fluency were also problematic but this seemed to be the case for all text types. This means that machine translation tools in general most often have issues translating the correct meaning while not producing a properly written text, regardless of the text type of the source text. Because of these shortcomings, the translation can look more like the original untranslated text than an independently written text created by a native speaker. This shows machine translation tools lack the skills human translators are expected to have in terms of cultural conventions, linguistic

connotations, or tackling translation problems by applying a fitting method to make the translation understandable for the target audience.

Machine translation can also offer opportunities for language acquisition. Students can for example translate a text or an audiovisual segment using machine translation to then revise it and correct all errors that were committed by the tool. This way language learners can become aware of both linguistic and terminology errors and compare the structures of the translation to the structures in their native tongue. For this application the language learner should already have a moderate or advanced language level and preferably be accompanied by a language teacher in order to make sure all errors are found. When this is not the case and foreign language learners with a poor level of the language use machine translation, they risk learning mistakes by not receiving correct language input during the learning process.

To meet the rising demand of translations, other technological tools were introduced to help translators speed up their work, translate texts more consistently, and work more efficiently in general. By implementing technology in the translation process, translators have stepped away from the very dated technique of translation on paper and modernized the way they work. This is especially true for translations that are of a specialized or technical nature, making the assignment more complex than for example a news article with the general public as the target audience. Using the correct terminology in those complex translations is inescapable and it is very important to avoid confusion or to avoid transferring the meaning of the source text incorrectly. Tools such as computer-assisted translation tools do just that and have become the go-to tool for translators around the world translating all kinds of documents. This also means that translators have to be skilled in the use of computers and this type of software as many, if not all employers in the translation industry require their staff to have excellent knowledge of such tools. That also means the translation curriculum needed to be altered to prepare students for what is ahead when they start working as language professional in for example the translation industry. Those computer-assisted translation tools (CAT-tools) often make use of translation memories and term bases to ensure the translations are consistent and use the right structures and terminology. In other words: it standardizes the translation process throughout the translation industry. CAT-tools also speed up the process by showing previously translated segments that can be used in the translation which saves time and therefore lowers the translation cost as this segment does not need to be translated again. It is worth mentioning that companies often prefer to have an extensive term base and translation memory of previously translated segments that have been approved by the client rather than implementing machine translation. Even though CAT-tools have been proven to be an excellent tool for translation, it is not used without a very significant risk. When using this tool the text is divided into different

segments, all placed in a table with the source text on the left and the translation in the column to the right so that the cell of the segment of the source text matches its translation. Because the text is divided into segments, translators risk focusing too much on the separate segments instead of on the text as a whole, which can have an impact on the quality of the final product. Another risk is using a translation memory or a term base of poor quality which will have an impact on the quality of the translation if the translator depends too much on it for their project. A last risk is about the quality of the tool itself: if a CAT-tool is not developed properly to the extent that it has an impact on the usability of that tool, it can affect the efficiency of the translation process negatively while using it. Today many tools are available to be used by translators and each translator can find a software package that suits them, their needs, and their budget by looking at what is available on the market and testing different programs.

Tools such as (online) writing assistants and word-processing software can also have a positive impact on the finished translations. These tools can scan the text on mistakes in terms of grammar, punctuation, complexity of the text, and language use. This is especially useful to carry out a last examination of the formal or linguistic aspects of the end product, after the translator has revised and proofread the translation. These tools might mark things that are not incorrect but it is a good idea to let the software go through the text anyway. If the translation is carried out in a CAT-tool it is always necessary to export the translation to the original file type or to a file type that can be recognized by for example a word-processing program. Even though the translation was revised in the tool, software such as Microsoft Office Word is still able to find mistakes such as for example wrongly placed spaces, capitalization, or informal language. These marked mistakes might not be wrong in that certain text but it is best to check all the marked errors one by one as small human mistakes are often easily spotted by such software where human revisers might have overlooked them.

5.2.2 Audiovisual translation

When looking at how machine translation tools can offer solutions for audiovisual translators, it is surprising how few possibilities it offers. Even though using such tools to convert speech to intralingual or interlingual subtitles is a very sophisticated matter, it is conspicuous to see that the translation industry is far from implementing a user-friendly version of such tools in the translation process of audiovisual content. When looking at how machine translation works for written language, there is only one similar tool that does a similar thing for audiovisual content. This is creating automated subtitles by using various tools such as YouTube's subtitling software on its own platform. However, due to the complexity it entails, most software solutions do struggle with creating interlingual subtitles. This is also the case for YouTube's software that offers both intralingual and interlingual automated subtitles but it quickly becomes clear that both options differ greatly from

subtitles that are created by a human professional translator. This means the subtitles are just transcriptions of the audio, without rephrasing sentences or structures that are used in spoken language but are wrong in written language, resulting in many grammatical mistakes. These mistakes are not always grammatical but also errors such as a slip of the tongue or stuttering which are also transcribed by the software. Furthermore, it showed its inability to avoid mistakes such as transferring the meaning incorrectly or misinterpreting the speech. Because the software does not detect the beginning and ending of sentences and it only transcribes literally what is being said, no punctuation and capitalization is applied throughout the entire video segment, making the subtitles very chaotic.

As the operating procedure of creating subtitles is very different from translating text thus making it impossible to use machine translation in the exact same way, other solutions came about to mimic what machine translation has done for the translation of text. The main initiatives are the introduction of speech recognition software and respeaking, which combines the use of computer tools, interpreting, and translation. This is especially useful for live subtitling, when subtitles need to be created as fast as possible to show them on screen while limiting the delay of the subtitles compared with the audio it represents. By introducing such tools and slightly delaying the subtitles, the translation maintains a sufficient level of quality to be understandable to its viewers. When using speech recognition software the speech is converted into text which is then used as subtitles or as a base for either intralingual or interlingual subtitles. This practice often leads to disappointing output, resulting in poorly written sentences, changes of meaning, or misinterpretations. This can partly be avoided by introducing respeaking which means a person repeats, rephrases or interprets what is being said in the video, which is then converted into text using speech recognition software. By paraphrasing or repeating the audio the quality of the input is enhanced which makes it easier for the speech recognition software to convert it into text which can then be used as a base for intralingual subtitles or as source text for interlingual subtitles that will then be translated. By interpreting the audio of the video directly, the translation has already been carried out and when this is converted into text by the speech recognition software, it can be used as a base for the interlingual subtitles. The practice of intralingual respeaking, regardless of whether its purpose is to create intralingual or interlingual subtitles, has been used for the past two decades whereas interlingual respeaking is a fairly new practice. In general, intralingual respeaking is more popular than interlingual respeaking because the results for the latter are not satisfactory yet and very little research has been carried out on this topic. Either way, both intralingual and interlingual respeaking combined with speech recognition software still need the intervention of a human translator to produce subtitles that have an acceptable level of quality.

Even though intralingual respeaking is widely used in countries around the world, many different strategies are applied to carry out this task. The reason for this is the lack of research which led to linguists experimenting with the practice. In some countries one linguist carries out all the work by translating and revising everything on their own whereas in other countries a team is formed consisting of a respeaker and a few helping hands to ensure the required level of quality is met. Thanks to the rapid globalization much more content needs subtitling and many European countries put together teams to carry out this task. In some of these countries the respeaker is joined by an interpreter and a subtitler whereas in other countries the respeaker is replaced by a stenographer that transcribes the audio as fast as possible. It is still unclear which approach is more efficient, how these translators should be trained and how the quality of the output should be evaluated. It is clear that tools such a speech recognition software and artificial intelligence are part of many of the approaches mentioned before. The purpose of this software is to support the professional translator – so they can work faster and more efficiently – and not to replace them with technology. It is unsure whether those tools will ever be able to properly interpret and translate spontaneous speech or dialectic language use, which are both very different from written language, both in terms of the use of grammar and understandability.

Often audiovisual translators use tools to carry out their work and make the process more efficient to meet the growing demand of subtitles. With the introduction of a new European directive and the rapid globalization more content than ever before needs to be subtitled with one purpose: to make this content available for a wider audience. In order to increase productivity, software was developed so translators can do the spotting and translation in one computer programme. This helps them to comply with subtitling rules while simplifying the whole translation process. Sometimes clients also attach a template to the assignment which can be imported in the computer programme and consists of the subtitles in the source language including the spotting or a file in which only the spotting has been done, which is called a “masterfile”. These templates can help the translator save time in case the subtitle conventions and rules are the same in the source language and the target language. It is worth mentioning that these templates are most often created for bigger projects that require subtitles in multiple languages with the aim of cutting costs by only having to do the spotting once. In reality these templates function as a base and the translator should be allowed to adjust the segments wherever necessary. Even though these templates are not necessarily a high-end technological tool, they can still be useful for audiovisual translators, when used properly and the client allows changes to the segments.

5.3 The future of machine translation and other tools

When combining all the different results it can be said that machine translation is used for both the translation of text and audiovisual translation. Some people might say that machine translation is not used for audiovisual translation as it does not translate the content from one language to another in one single stage but translation can also mean to turn speech into text to then translate it into another language if needed. The same goes for the translation of text: the machine translation tool carries out the initial translation but additional work is needed to turn this into a decently written text. This means that machine translation is a tool that is used as an aid for the translation of both text and audiovisual content but it is clear that it contributes more to the translation process of written language compared to audiovisual translation. This is mainly attributed to the nature of the source which introduces an additional stage in the translation process when translating audiovisual content.

About ninety years after the initial studies on machine translation it is clear the phenomenon has come a long way. It has shown some promising results but it still is far from suitable to be used autonomously. The evolution has offered us a tool that can be implemented in the translation process to help professional translators translate certain structures or even entire texts. To use machine translation for audiovisual translation a lot of additional research and developments will be needed as it shows some disappointing results at the moment. Even though machine translation for the translation of text still has its downsides, it has come a long way and it shows that using machine translation for audiovisual translation might not be impossible and will someday offer a better working tool. It is hard to tell when that will be but the expectation is that machine translation for both the translation of text and audiovisual translation will further develop into a more useful and trustworthy tool.

As for now, machine translation is at a stage where it can be used by professional translators but only when these professionals intend to use it as a supporting tool and aim to translate in the approved manner. Translators must critically assess the output of machine translation tools before implementing it in their translations. Furthermore it is advisable to use some form of a computer-assisted translation tool with a properly developed translation memory and term base before opting to implement machine translation as a major part of the translation process. When translators do consider to use machine translation in their translation process, they must not want to replace the CAT-tools by it as it can only be seen as an additional form of aid. If they were to replace the CAT-tools by machine translation, the quality of their translation would be greatly in danger in terms of for example consistency or the proper use of grammar. For amateur translators using machine translation

it is often because they are dealing with a language they have little or no knowledge of and they would not be able to understand the content otherwise. In that case machine translation can offer a solution to simply understand what is being said in the foreign language without having the intention of using the output in any other way.

6 Conclusion

Even though the name of this thesis is “Using Machine Translation for Translation and Audiovisual Translation, a Case Study” and both translation branches are closely related to each other, the way machine translation works for both branches is very different. This is mainly due to the added layer of complexity for the translation of audiovisual content that is spoken language, but also the fact that spoken language is often more colloquial by nature. It is also important to mention that machine translation for audiovisual translation has been studied for about thirty years but very few scientists have ventured to practically study this topic. This is can be attributed to the interdisciplinarity of the topic and the complexity that is added to the already technical machine translation for text. Having said this, the main focus of this research is to lay bare the strengths and weaknesses of using machine translation for both translation of text and audiovisual translation. It quickly became clear that the issues needed to be kept separated per translation branch because when using machine translation for the translation of text, it made the most mistakes in terms of consistency, meaning, and fluency whereas using it for audiovisual translation it resulted in mistakes relating to interpreting the spoken language correctly or completely and producing well-written and grammatically correct subtitles. The output of the machine translation of text also seemed to need less re-working in terms of sentence structuring as for the audiovisual machine translation it was mainly a transcription of the speech even though this was often grammatically incorrect in written language.

When looking at using machine translation, it looks promising at first glance but once you pay more attention to its output, it quickly becomes clear it does not produce a decently written translation. This means it can give its user a sense of the meaning of the text or video but it will contain language mistakes and sometimes even misinterpretations. Therefore language professionals are sometimes better off to start from scratch whereas the general public can and will use it for a different purpose: to understand something they otherwise would not be able to understand. It is important that both parties know about the weaknesses and threats of machine translation and do not depend on it too much. This also confirms the hypothesis that machine translation cannot be used autonomously to produce a qualitative translation. The hypothesis also predicted that it could only be seen as a translation aid to speed up the translation process but it might be more useful to invest in a well-developed computer assisted tool and set up translation memories and term bases. This is mainly because these aids – such as a translation memory – are created from content produced by human translators and thus usually consist of better and more consistent language use. Machine translation is able to offer inspiration for the translation of certain words or structures but the translator must critically analyse its output before implementing it in their translation.

6.1 Looking ahead

When looking at future research, one suggestion is to do the same research but implement more machine translation tools and test materials to better generalize the findings for all tools of this kind. However, by applying methodological triangulation, I am confident that the findings of this research are trustworthy and represent how machine translation can currently be used for translation of text and audiovisual translation. Therefore I strongly believe this thesis can be used as a line of action for future research, not necessarily to carry out research on the performance of machine translation but to see where its problems lie. This way researchers and developers can identify the most common issues and aim to further develop the technology to resolve the main weaknesses so machine translation can little by little become a better-functioning tool that produces better output for both professional translators and laypeople.

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7 Appendixes

7.1 Appendix 1: technical-scientific translation

This view of Ingenuity on the Martian surface was captured by NASA's Perseverance rover on April 8, 2021. The helicopter is going through a final series of tests before its first flight.	**Dit beeld van Ingenuity op het Martiaanse oppervlak werd vastgelegd door NASA's Perseverance rover op 8 april 2021. De helikopter ondergaat een laatste reeks tests voor zijn eerste vlucht.**
PHOTOGRAPH BY NASA/JPL-CALTECH	FOTO DOOR NASA/JPL-CALTECH
SCIENCE	WETENSCHAPPEN (1)
NEWS	NIEUWS
NASA's Mars helicopter gets ready to make history	**NASA's Mars-helikopter maakt zich klaar om geschiedenis te schrijven**
After a technical hiccup, engineers are hoping the Ingenuity spacecraft will soon become the first vehicle to take flight on another world.	**Na een technisch probleem hopen de ingenieurs dat het Ingenuity-ruimtevaartuig weldra het eerste voertuig wordt dat op een andere wereld zal vliegen.**
BY JAY BENNETT	DOOR JAY (7) BENNETT
PUBLISHED APRIL 12, 2021	GEPUBLICEERD OP 12 APRIL, 2021
• 5 MIN READ	• 5 MIN LEZEN
NASA is nearly ready to attempt the first flight on another planet. The space agency's small helicopter, called Ingenuity, has been deposited in a flat area on Mars, and it is running through a series of final tests before it tries to lift into the thin Martian air.	NASA is bijna klaar voor een poging tot de eerste vlucht op een andere planeet. De kleine helikopter van de ruimtevaartorganisatie, Ingenuity genaamd **(1)**, is neergezet in een vlak gebied op Mars, en het doorloopt een reeks laatste tests voordat het probeert op te tillen **(1)** in de ijle Martiaanse lucht.
Ingenuity's first flight was originally slated for April 11, but the mission hit a snag during a pre-flight test. While trying to spin the helicopter's rotors at full speed without leaving the ground, Ingenuity's onboard computer ended the test early. NASA says the helicopter is safe and communicating with Earth. The team plans to update the software on the helicopter and "will set a flight date next week," according to a NASA status update.	De eerste vlucht van Ingenuity was oorspronkelijk gepland voor 11 april, maar de missie stuitte op een probleem tijdens een test voorafgaand aan de vlucht. Toen hij probeerde de rotors van de helikopter op volle snelheid te laten draaien zonder de grond te verlaten, beëindigde de boordcomputer van de Ingenuity de test voortijdig. NASA zegt dat de helikopter veilig is en communiceert met de aarde. Het team is van plan om de software van de

	helikopter bij te werken en "zal volgende week een vluchtdatum vaststellen," volgens een NASA status update **(7)**.
Flying on Mars is incredibly challenging because of the planet's wispy atmosphere, which is equivalent to an altitude of about 100,000 feet on Earth—much higher than even the most capable helicopters can fly. The highest helicopter flight in history occurred in 1972, when French aviator Jean Boulet flew to 40,820 feet at an airbase northwest of Marseille.	Vliegen op Mars is een ongelooflijke uitdaging vanwege de wispelturige atmosfeer van de planeet, die overeenkomt met een hoogte van ongeveer 100.000 voet op aarde - veel hoger dan zelfs de meest capabele helikopters kunnen vliegen. De hoogste helikoptervlucht in de geschiedenis vond plaats in 1972, toen de Franse vliegenier Jean Boulet naar 40.820 voet vloog op een luchtmachtbasis ten noordwesten van Marseille.
During its first flight, Ingenuity will ascend to about 10 feet, hover and turn slightly, then touch back down. The trip will last just 30 seconds, but if it's successful, Ingenuity will open up new opportunities for exploring other worlds, says MiMi Aung, the Ingenuity project manager at NASA's Jet Propulsion Laboratory.	Tijdens zijn eerste vlucht zal de Ingenuity opstijgen tot ongeveer 10 voet, in de lucht blijven hangen en een beetje draaien, en dan weer landen. De reis zal slechts 30 seconden duren, maar als hij succesvol is, zal Ingenuity nieuwe mogelijkheden openen **(5)** om andere werelden te verkennen, zegt MiMi Aung, de Ingenuity projectmanager bij NASA's Jet Propulsion Laboratory.
"JPL, right? We dare mighty things," says Aung, referring to the NASA lab's official motto.	"JPL, toch? We dare mighty things," zegt Aung, verwijzend naar het officiële motto van het NASA-lab.
NASA hopes that the 19-inch-tall helicopter will pave the way for bigger rotorcraft on Mars, allowing scientists to study the red planet from a new perspective. Spacecraft orbiting Mars give a global sense of the planet's structure and geologic features, while landers and rovers on the surface provide an up-close look at the minerals and rock layers that hold clues about the planet's history.	NASA hoopt dat de 19 inch hoge helikopter de weg zal vrijmaken **(1)** voor grotere rotorvliegtuigen op Mars, zodat wetenschappers de rode planeet vanuit een nieuw perspectief kunnen bestuderen. Ruimtevaartuigen in een baan om Mars geven een algemeen beeld van de structuur en de geologische kenmerken van de planeet, terwijl landers en rovers op het oppervlak de mineralen en gesteentelagen van dichtbij bekijken die aanwijzingen bevatten over de geschiedenis van de planeet.
Helicopters on Mars would be able to study entire craters, canyons, and mountains in much more detail than orbiters, says Matt Shindell, a curator of planetary science and exploration at	Helikopters op Mars zouden hele kraters, ravijnen en bergen in veel meer detail kunnen bestuderen dan orbiters, zegt Matt Shindell, een curator van planetaire wetenschap en exploratie

the Smithsonian's National Air and Space Museum (NASM). They could also reach locations such as canyon walls or volcanic slopes that a rover could never visit.	bij het National Air and Space Museum (NASM) van het Smithsonian. Ze zouden ook locaties kunnen bereiken zoals ravijnwanden of vulkanische hellingen die een rover nooit zou kunnen bezoeken.
"What a helicopter would potentially do is bridge the difference between that orbital perspective and the ground perspective, to where we could now get a little bit more of a sense of Mars regionally," Shindell says.	"Wat een helikopter zou kunnen doen, is het verschil overbruggen tussen dat orbitale perspectief en het grondperspectief, zodat we nu een beetje meer een gevoel van Mars op regionaal niveau zouden kunnen krijgen," zegt Shindell.
A future flying machine could also be used as "a scout for rover missions, to overlook a horizon to plan out where to drive," adds Steve Jurczyk, NASA's acting administrator. "Eventually for human missions to Mars, it could be a scout for the astronauts."	Een toekomstige vliegende machine zou ook kunnen worden gebruikt als "een verkenner voor rover missies, om een horizon te overzien om te plannen waar te rijden," voegt Steve Jurczyk, NASA's waarnemend administrateur **(1)**, toe. "Uiteindelijk zou het voor menselijke missies naar Mars een verkenner voor de astronauten kunnen zijn."
Where air is thin and nights are cold	**Waar de lucht ijl is en de nachten koud**
NASA's Perseverance rover deposited Ingenuity on the surface after it successfully landed on Mars on February 18. The rover is now serving as a communications relay for the helicopter's test flight.	NASA's Perseverance rover **(5)**heeft Ingenuity op het oppervlak afgezet nadat het op 18 februari met succes op Mars is geland. De rover doet nu dienst als communicatierelais voor de testvlucht van de helikopter.
The flight attempt is risky because Mars's thin air makes it much harder to use rotor blades, like those on a helicopter, to achieve controlled flight. If something goes wrong—a sensor malfunctions or an unexpectedly strong gust of wind hits Ingenuity—the craft could come crashing to the ground.	De vluchtpoging is riskant omdat de ijle lucht op Mars het veel moeilijker maakt om met rotorbladen, zoals die van een helikopter, een gecontroleerde vlucht te maken. Als er iets fout gaat - een sensor werkt niet goed of een onverwacht sterke windvlaag raakt Ingenuity - kan het vaartuig op de grond neerstorten.
Some early ideas for a Martian helicopter were studied in the 1990s, but it took another couple decades before the required technology was advanced enough to actually fly a prototype in a vacuum chamber on Earth. Batteries had to become more efficient, computers had to get smaller, and lightweight composite materials had to be developed for the helicopter's rotors.	In de jaren negentig werden enkele vroege ideeën voor een Martiaanse helikopter bestudeerd, maar het duurde nog een paar decennia voordat de vereiste technologie ver genoeg gevorderd was om daadwerkelijk met een prototype in een vacuümkamer op aarde te kunnen vliegen. Batterijen moesten efficiënter worden, computers moesten kleiner worden en

	er moesten lichtgewicht composietmaterialen worden ontwikkeld voor de rotors van de helikopter.
Ingenuity will spin those four-foot-wide rotors up to a frenzied speed of about 2,500 rotations per minute. It needs to autonomously control its rotors very quickly to remain stable in the air, using a tiny computer similar to a smartphone's electronics, as well as technology developed for self-driving cars.	Ingenuity zal die vier voet brede rotors laten draaien tot een waanzinnige snelheid van ongeveer 2.500 rotaties per minuut. Hij moet zijn rotors zeer snel autonoom kunnen besturen om stabiel in de lucht te blijven, met behulp van een piepkleine computer die vergelijkbaar is met de elektronica van een smartphone, en met technologie die is ontwikkeld voor zelfrijdende auto's.
In between flights, the small helicopter has to contend with nighttime temperatures that plummet as low as -130°F. A small solar panel specially tuned to the amount of sunlight available on Mars feeds batteries that power the helicopter's motors and run a heater to keep the craft warm at night.	Tussen de vluchten door heeft de kleine helikopter te kampen met nachttemperaturen die kunnen dalen tot -130°F **(1)**. Een klein zonnepaneel dat speciaal is afgestemd op het beschikbare zonlicht op Mars, voedt de batterijen die de motoren van de helikopter aandrijven en een verwarming aandrijven om het toestel 's nachts warm te houden.
When they're ready to try again, the team plans to fly Ingenuity around midafternoon, local Mars time. Flying in the middle of the afternoon will allow the helicopter's solar panel to charge its batteries before and after the flight, so the batteries still have some juice to run the heater before Ingenuity has to survive another frigid night.	Als ze klaar zijn om het opnieuw te proberen, plant het team om Ingenuity rond het midden van de middag te laten vliegen, plaatselijke Marstijd. Door halverwege de middag te vliegen kan het zonnepaneel van de helikopter de accu's voor en na de vlucht opladen, zodat de accu's nog wat stroom hebben om de verwarming te laten werken voordat Ingenuity weer een ijskoude nacht moet zien te overleven.
NASA will also be monitoring wind gusts with an instrument on the Perseverance rover to determine the best time to fly.	NASA zal ook de windvlagen in de gaten houden met een instrument op de Perseverance rover om te bepalen wat het beste moment is om te vliegen.
"Ingenuity has been tested in simulated winds, using computer models as well as a big 'wind-wall' the team built in one of our test chambers at JPL," Bob Balaram, chief engineer of Ingenuity, wrote in a status update ahead of the first flight. "However, we can't test over the	"Ingenuity is getest in gesimuleerde winden, met behulp van computermodellen en een grote 'windmuur' die het team heeft gebouwd in een van onze testkamers bij JPL," schreef Bob Balaram, hoofdingenieur van Ingenuity, in een statusupdate voorafgaand aan de eerste vlucht. "We kunnen echter niet testen in het hele scala

entire range of wind conditions that one might experience on Mars.”	van windcondities die men op Mars zou kunnen ervaren."
As a token of the flight’s historic nature, Ingenuity carries a postage-stamp-size piece of fabric from the original Wright Flyer, which carried Orville Wright on the first powered flight of a heavier-than-air aircraft in 1903. That flight over the hills of Kitty Hawk, North Carolina, lasted only 12 seconds.	Als teken van het historische karakter van de vlucht draagt Ingenuity een stuk stof ter grootte van een postzegel van de originele Wright Flyer, die Orville Wright vervoerde op de eerste gemotoriseerde vlucht van een zwaarder dan luchtvliegtuig **(2)** in 1903. Die vlucht boven de heuvels van Kitty Hawk, North Carolina, duurde slechts 12 seconden.
“The Wright brothers are my motivation,” JPL’s Aung says. Before their flight, “a lot of people had partial tests, partial success, you know, theoretical predictions, analytics predictions, some might even have had philosophical predictions” for how to fly an airplane. “But at some point,” Aung says, “you just have to have the guts.”	"De gebroeders Wright zijn mijn motivatie," zegt Aung van JPL. Vóór hun vlucht "hadden veel mensen gedeeltelijke proeven, gedeeltelijk succes, je weet wel, theoretische voorspellingen, analytische voorspellingen, sommigen hadden misschien zelfs filosofische voorspellingen" over hoe een vliegtuig te besturen. "Maar op een gegeven moment," zegt Aung, "moet je gewoon het lef hebben."

7.2 Appendix 2: literary translation

Seconds 'til the Revolution	Seconden tot de revolutie
By Alejandra Medina	Door Alejandra Medina
1968. East L.A.	1968. Oost L.A.
Dorita sits at her desk, a bundle of nerves and impatient feet. The heels of her shoes squeak on the linoleum tiles as she taps her toes to the rhythm of the clock's ticking. Sweat drips down her back. She imagines an entire colony of ants crawling beneath the fabric of her blouse. They collect on the elastic waistband of her skirt and soak through, making her twitch in her seat.	Dorita zit aan haar bureau, een bundel zenuwen en ongeduldige voeten. De hakken van haar schoenen piepen op de linoleumtegels als ze met haar tenen tikt op het ritme van de tikkende klok. Het zweet druppelt over haar rug. Ze stelt zich een hele kolonie mieren voor die onder de stof van haar blouse kruipen. Ze verzamelen zich op de elastische tailleband van haar rok en sijpelen erdoorheen, waardoor ze ineenkrimpt op haar stoel.
Around her, several others betray their nerves too. Fingers pull at hair, pencils tap furiously against desks. Mr. McDonald stands at the front of the classroom, chalk squeaking on the blackboard. He blabbers on about the Civil War.	Om haar heen verraden ook anderen hun zenuwen. Vingers trekken aan hun **(5)** haar, potloden tikken woest **(1)** tegen het bureau **(1)**. Meneer McDonald staat voorin de klas, het krijt piept op het schoolbord. Hij brabbelt maar door over de Burgeroorlog.
Dorita closes her eyes and breathes. She starts to wonder if maybe she should just remain in class after all, and be a good student. Sit here and make her parents proud.	Dorita sluit haar ogen en haalt adem **(5)**. Ze begint zich af te vragen of ze misschien toch maar in de klas moet blijven, en een goede leerling moet zijn. Hier zitten en haar ouders trots maken.
Or she could walk out.	*Of ze kan weglopen*.

The words reverberate within her head, syllables splitting and reproducing like cells--infinite. *Walk out, walk out, walk out*.	De woorden weerklinken in haar hoofd, lettergrepen splitsen zich en vermenigvuldigen zich als cellen - oneindig. *Ga weg, ga weg, ga weg* **(8)**.
Her boyfriend Emmanuel had dropped out of school last fall. The palms of his hands had still been bright red from where his teacher had brought down the ruler with a vengeance.	Haar vriend Emmanuel was afgelopen herfst van school gegaan. Zijn handpalmen waren nog steeds knalrood van de wraakactie **(2)** van zijn leraar.
He had forgotten the word 'escalate.' His teacher had asked, with an impatient urgency, "Come on, Emmanuel. What are you trying to say?"	Hij was het woord 'escaleren' vergeten. Zijn leraar had met een ongeduldige drang gevraagd: "Kom op, Emmanuel. Wat probeer je te zeggen?"
"It had grown! Ugh." He had pulled at his hair, trying to yank out that darn word that just wasn't there. "How do you say it? *Esalar*."	"Het was gegroeid! Ugh." Hij trok **(1)** aan zijn haar, probeerde dat verdomde woord eruit te rukken dat er gewoon niet was. "Hoe zeg je het? *Esalar*."
The Spanish escaped him, an honest mistake. It was what one did when trying to remember a word. One simply spoke it in another language, hoping the brain could translate. But a bit of Spanish meant punishment and the ruler was promptly pulled out from a drawer in the teacher's desk.	Het Spaans ontglipte hem, een eerlijke vergissing. Het was wat je deed als je een woord probeerde te onthouden **(1)**. Je sprak **(5)** het gewoon in een andere taal en hoopte dat je hersenen het konden vertalen. Maar een beetje Spaans betekende straf en de liniaal werd prompt uit een la in het bureau van de leraar getrokken.
He was painting a mural now, up Eagle street. One of many, he said. His biggest dream was to become an artist and	Hij was nu een muurschildering aan het maken, in Eagle street. Een van de velen, zei hij. Zijn grootste droom was

make East L.A. feel like home. Home, sweet home.	om kunstenaar te worden en Oost-L.A. als thuis te laten voelen. Home, sweet home.
“You know, this place is *de la raza*.“ He’d tell her. “I just want to make it *look* like it.”	"Weet je, deze plek is *de la raza*." Vertelde hij haar. "Ik wil het er alleen zo laten *uitzien*."
Dorita knew what he meant. If Los Angeles were alive, its heart would be here in the East side. This is where the streets call out to her in English and Español. Where the wide sun-baked roads are full of the symphonic sounds of rumbling cars and voices shouting out in accents, their English still thick with their native tongue. The Santa Ana winds in this part of the city carry with them the smells of sizzling meat from the taco stand in the corner, of fabric softener from the laundromat, of the thick scent of oil from the auto shops. Palm trees stand at the edges of the sidewalks, their green leaves exploding out like fireworks against the sky. This was a heart that beat with the rhythm of a thousand tambores and it pumped pure Chicano blood.	Dorita wist wat hij bedoelde. Als Los Angeles zou leven, zou z'n hart hier in de East Side liggen. Hier roepen de straten haar in het Engels en Spaans **(1)** toe. Waar de brede zonovergoten wegen vol zijn **(5)** van de symfonische klanken van ronkende auto's en stemmen die in accenten schreeuwen, hun Engels nog dik aangezet **(5)** met hun moedertaal. De Santa Ana-winden in dit deel van de stad dragen de geuren met zich mee van sissend vlees van de **(6)** tacokraam op de hoek, van wasverzachter van de wasserette, van de dikke geur van olie van de autowinkels **(1)**. Palmbomen staan aan de rand van de stoepen, hun groene bladeren steken als vuurwerk af tegen de hemel. Dit was een hart dat klopte met het ritme van duizend tambores en het pompte zuiver Chicano-bloed.
Dorita fidgets in her chair as the clock strikes the hour. Time was at it again with its usual tricks, flowing too fast but ticking too slowly. She wants to spring	Dorita friemelt in haar stoel als de klok het uur slaat. De tijd is weer bezig met zijn gebruikelijke streken, te snel stromend maar te langzaam tikkend. Ze wil van haar stoel opveren en proberen

from her seat and try to ease the nerves itching beneath her skin.	de zenuwen die onder haar huid jeuken te verlichten.
East L.A. is also home because, well, she lived here didn't she? She pictures her house and its Virgen de Guadalupe standing sentinel in the front yard. Her parents' faces peer at her from the front porch, their smiles soft and sad. They loved this city. Her dad's skin was proudly tinged with the "East L.A. sun," as he called it, and her mama loved rolling down the windows of their Buick as they drove through the city at night, letting the cool breezes blow the day's work off of her skin.	Oost-L.A. is ook haar thuis, want, wel, ze heeft hier gewoond **(1)**, nietwaar? Ze ziet haar huis voor zich met de Virgen de Guadalupe die wacht houdt in de voortuin. De gezichten van haar ouders kijken haar aan vanaf de veranda, hun glimlach zacht en droevig. Ze hielden van deze stad. Haar vaders huid was trots getint met de "Oost-L.A. zon," zoals hij het noemde, en haar moeder hield ervan de ramen van hun Buick naar beneden te draaien als ze 's avonds door de stad reden, om de koele briesjes het werk van de dag van haar huid te laten blazen.
They'd be furious if they knew what she was about to do.	Ze zouden woedend zijn als ze wisten wat ze van plan was. Dorita krabt aan haar hoofdhuid. Het zweet druppelt nu in zenuwachtige stroompjes, verzamelt zich achter haar oren en rolt naar beneden in haar ogen. **(2)**
Dorita scratches at her scalp. The sweat was dripping now in nervous rivulets, collecting behind her ears and rolling down into her eyes.	Dorita krabt aan haar hoofdhuid. Het zweet druppelt nu in zenuwachtige stroompjes, verzamelt zich achter haar oren en rolt naar beneden in haar ogen.
Her parents had followed the monarch butterflies down to the city of Angels, and had stayed here, hoping that the	Haar ouders waren de monarchvlinders gevolgd naar de stad der Engelen, en waren hier gebleven, in de hoop dat de

city would find them as beautiful as they found it.	stad hen net zo mooi zou vinden als zij haar vonden.
But did it?	Maar was dat zo?
She had been six, at the grocery store with her parents when a white man had slammed his shopping cart into theirs. He had stared them down and had tossed slurs into her father's face, words that smacked into him like eggs, cracking over his skull, sinking into his flesh.	Ze was zes jaar geweest **(5)**, met haar ouders in de supermarkt, toen een blanke man met zijn boodschappenkarretje tegen dat van hen aan was gereden. Hij had hen aangestaard en scheldwoorden in haar vaders gezicht gesmeten, woorden die als eieren in hem sloegen, over zijn schedel sloegen, in zijn vlees zonken.
Back home, while mama cried into the brown paper grocery bags, dad had kneeled down and spoken into her little face. "Forget what that man said." He smiled, the slurs still dripping down his face like yolk. "Those were simply the words of an ignorant fool."	Thuis, terwijl mama in de bruine papieren boodschappentassen huilde, had papa geknield en in haar kleine gezichtje gesproken **(5)**. "Vergeet wat die man zei." Hij glimlachte, de beledigingen drupten nog steeds als dooier langs zijn gezicht. "Dat waren gewoon de woorden van een onwetende dwaas."
"He told us to go back to our country." Dorita had said. "Do we not belong here?"	"Hij zei dat we terug moesten gaan naar ons land." Dorita had gezegd. "Horen wij hier niet thuis?"
"Of course we do." Her dad said. "This is our home now. Your mama and I, we made our mark by having you. Soon enough, it'll be your turn."	"Natuurlijk wel." Zei haar vader. "Dit is nu ons **(6)** thuis. Je moeder en ik, we hebben onze stempel gedrukt door jou te krijgen. Snel genoeg, zal het jouw beurt zijn."
"To leave my mark?"	"Om mijn stempel te drukken?"

“Exactly.” He chuckled. “But you? You’re not only gonna leave a mark. You’re going to change the world.”	"Precies." Hij grinnikte. "Maar jij? Jij gaat niet alleen een stempel achterlaten. Jij gaat de wereld veranderen."
Walk out.	*Weglopen.*
Those words again. They tug at her, daring, taunting.	Weer die woorden. Ze trekken aan haar, uitdagend, uitdagend **(1)**.
Emmanuel is an artist. Her father is a mechanic, her mother just a lady who cleans houses. But what about her? Who was she? And what mark would she leave?	Emmanuel is een artiest. Haar vader is een monteur, haar moeder gewoon een dame die huizen schoonmaakt. Maar hoe zit het met haar? Wie was zij? En welk spoor **(8)** zou ze achterlaten?
Walk out.	*Weglopen.*
A guidance counselor had once laughed in her face after Dorita had asked her how she could become a teacher.	Een begeleidingsadviseur had haar ooit in haar gezicht uitgelachen nadat Dorita haar had gevraagd hoe ze lerares kon worden.
And Emmanuel had looked at her funny. “A teacher? After all they do to us, you want to become one of them?”	En Emmanuel had haar raar aangekeken. "Leraar? Na alles wat ze ons hebben aangedaan, wil je een van hen worden?"
Walk out.	*Weglopen.*
Yes. A teacher. One who taught others to change the world and leave their mark as well.	Ja. Een leraar. Iemand die anderen leerde om de wereld te veranderen en ook hun stempel achter te laten.
“Dora?” Mr. McDonald calls out to her, striking his desk with the palm of his hand. “Dora, are you listening?”	"Dora?" Meneer McDonald roept haar en slaat met zijn handpalm op zijn bureau. "Dora, luister je?"
She stares at the vein pulsing in his forehead. Her heart hammers within her chest. But before she can speak, a tidal wave rises and roars from the	Ze staart naar de ader die in zijn voorhoofd pulseert. Haar hart bonst in haar borstkas. Maar voordat ze iets kan zeggen, komt er een vloedgolf uit de

hallway, becoming louder and louder until it hits their classroom door with kicks and pummeling fists.	gang, die steeds luider wordt, tot hij met schoppen en vuistslagen tegen de deur van hun klaslokaal slaat.
The wave shouts, “Walkout!”	De golf schreeuwt: "Wegwezen!"
And Dorita rises, knowing East L.A. would thank her for what she was about to do.	En Dorita staat op, wetende dat East L.A. haar dankbaar zou zijn voor wat ze op het punt stond te doen. **(5)**

7.3 Appendix 3: economic-financial translation

Your new (tax) year resolution ... give your finances a spring clean	**Uw nieuwe (fiscale) jaarvoornemen ... geef uw financiën een voorjaarsschoonmaak**
The new financial year started last week and there's no better time to take stock of all your investments	Het nieuwe boekjaar is vorige week begonnen en er is geen beter moment om de balans op te maken van al uw investeringen
Plough through all the paperwork and scrutinise your finances for better returns next year. Photograph: Stock Photo	Doorzoek al het papierwerk en neem uw financiën onder de loep voor een beter rendement volgend jaar **(5)**. Foto: Stock Foto
Shane Hickey	Shane Hickey
Sun 11 Apr 2021 05.30 BST	zon **(7)** 11 apr 2021 05.30 u BST
Happy new tax year. While it is unlikely that many champagne corks were popped, 6 April was a landmark for anyone who wants to take a fresh look at their finances.	Gelukkig nieuw belastingjaar. Hoewel het onwaarschijnlijk is dat er veel champagnekurken zijn geknald, was 6 april een mijlpaal voor iedereen die een frisse blik op zijn financiën wil werpen.
"This is often a good time to take stock," says Sarah Coles, a personal finance analyst at Hargreaves Lansdown. "Revisit things like savings, investments and pensions at least once a year to make sure they still reflect your needs."	"Dit is vaak een goed moment om de balans op te maken," zegt Sarah Coles, analist persoonlijke financiën bij Hargreaves Lansdown. "Bekijk zaken als spaargeld, beleggingen en pensioenen minstens één keer per jaar opnieuw om er zeker van te zijn dat ze nog steeds aan je behoeften voldoen."
Here's how to prepare yourself for the (tax) year ahead.	Hier leest u hoe u zich kunt voorbereiden op het komende (belasting)jaar.
Pensions	**Pensioenen**

Now is as good a time as any to take stock of pension savings in old and new schemes to see what they are worth, and the projections of what you will get when you retire.	Het is nu een goed moment om **(1)** de balans op te maken van uw pensioensparen in oude en nieuwe regelingen om te zien wat het waard is, en de prognoses van wat u krijgt als u met pensioen gaat.
The Money Advice Service, and many pension providers, have online calculators. Put in a target income on retirement, contributions and current pots, to estimate how much more you need to contribute before you retire.	De Money Advice Service en veel pensioenuitvoerders hebben online calculators **(1)**. Voer een streefinkomen bij pensionering, bijdragen en huidige potjes in,**(7)** om te schatten hoeveel u nog moet bijdragen voordat u met pensioen gaat.
If someone is considering changing the levels of risk in how their pension is invested – to either try to make their money work harder, or to take a more conservative approach amid changing markets – then age is key. Younger investors are at the best stage to take a risk, says Rebecca O'Connor, head of pensions and savings at Interactive Investor. "It seems counterintuitive to invest such a valuable pot of money into higher-risk investments for young workers who are new to pensions, and might want to feel their way at first. But higher-risk strategies over the long term tend to outperform. The key bit is 'over the long term,'" she says.	Als iemand overweegt het risiconiveau van zijn pensioenbeleggingen te wijzigen - om te proberen zijn geld harder te laten werken, of om een meer conservatieve aanpak te kiezen in een veranderende markt - dan is leeftijd de sleutel. Jongere beleggers bevinden zich in de beste fase om risico's te nemen, zegt Rebecca O'Connor, hoofd Pensioenen en Sparen **(7)** bij Interactive Investor. "Het lijkt contra-intuïtief om zo'n waardevolle pot geld te investeren in beleggingen met een hoger risico voor jonge werknemers die nieuw zijn met pensioenen, **(7)** en misschien eerst hun weg willen voelen. Maar strategieën met een hoger risico hebben op de **(5)** lange termijn de neiging om beter te presteren. Het sleutelwoord is 'op de **(5)** lange termijn'," zegt ze.

“If you wanted your money in three years to buy a house, higher risk would not be the right strategy. Nor would it be if you are an older worker very close to retirement. Higher risk at this point leaves you exposed to heavy losses should the markets nosedive.”	"Als u uw geld over drie jaar wilt gebruiken om een huis te kopen, is een hoger risico niet de juiste strategie. Dat zou het evenmin zijn als je een oudere werknemer bent die dicht bij zijn pensioen staat. Hoger risico op dit punt **(5)** stelt je bloot aan zware verliezen als de markten een duikvlucht maken."
A growing number of people want to live a greener lifestyle in 2021 and shifting your finances towards sustainable options is a key way to do this. Check how your workplace pension is invested. If the default option is not prioritising ethical investments, many schemes offer the option of moving into sustainable funds. This should not compromise the returns you get, says O’Connor.	Een groeiend aantal mensen wil in 2021 een groenere levensstijl leiden en het verschuiven van uw financiën naar duurzame opties is een belangrijke manier om dit te doen. Controleer hoe uw werkplek pensioen **(5)** wordt geïnvesteerd. Als de standaardoptie geen prioriteit geeft aan ethische beleggingen, bieden veel regelingen de mogelijkheid om over te stappen naar duurzame fondsen. Dit mag niet ten koste gaan van het rendement dat je krijgt, zegt O'Connor.
Make sure you are happy with what the fund manager is investing in. “When choosing any ethical or sustainable fund, check the top holdings first. Your version of ethical might not be their version of ethical.	Zorg ervoor dat je tevreden bent met waar de fondsbeheerder in belegt. "Bij het kiezen van een ethisch of duurzaam fonds, controleer eerst de top holdings **(5)**. Jouw versie van ethisch is misschien niet hun versie van ethisch.
“If it isn’t, and you really know your own mind on what you want, self-invested personal pensions (Sipps) can provide the control you might benefit from,” she says.	"Als dat niet het geval is, en je weet echt wat je wilt, dan kan een zelf belegd persoonlijk pensioen (self-invested personal pensions, Sipps) je de controle geven waar je baat bij zou kunnen hebben," zegt ze.

Sipps, essentially DIY pensions, allow consumers to invest and manage their own money.	Sipps, in wezen doe-het-zelfpensioenen, stellen consumenten in staat hun eigen geld te beleggen en te beheren.
It is also worth looking now at the fees you are paying for the management of both workplace and personal pensions, and comparing them to other providers.	Het is ook de moeite waard om nu te kijken naar de kosten die u betaalt voor het beheer van zowel werkplekpensioenen als persoonlijke pensioenen, en deze te vergelijken met andere aanbieders.
“If you don’t know what fees you are paying on your current and past pensions, check and compare. You might end up horrified at what you have been paying without realising it over the years,” adds O’Connor.	"Als u niet weet welke kosten u betaalt voor uw huidige en vroegere pensioenen, controleer en vergelijk. Je **(8)** zou kunnen schrikken van wat je hebt betaald zonder het te beseffen door de jaren heen," voegt O'Connor toe.
Isa now, not later	**Isa (1) nu, niet later**
The end of the tax year is traditionally met with a rush of people investing in Isas as they use up their £20,000 annual allowance before the deadline. But leaving it until the last minute means you can miss out on a year of returns.	Het einde van het belastingjaar wordt traditioneel gevolgd door een stormloop van mensen die in Isa's investeren omdat ze hun jaarlijkse toelage van £20.000 opgebruiken voor de deadline. Maar als je het tot het laatste moment laat wachten, kun je een jaar aan rendement mislopen.
Jason Hollands, of financial advisers Bestinvest, says that in the last 40 tax years, the stock market has delivered positive results almost 80% of the time. “If you are in a position to use your Isa allowance early, you are highly likely to enjoy an extra year of tax-free growth,” he says.	Jason Hollands, financieel adviseur bij Bestinvest **(1)**, zegt dat de aandelenmarkt in de afgelopen 40 belastingjaren bijna 80% van de tijd positieve resultaten heeft opgeleverd. "Als je in een positie bent om je Isa-toelage vroegtijdig te gebruiken, is de kans groot dat je

	geniet van een extra jaar belastingvrije groei," zegt hij.
Coles says that someone who invested on the first day of the tax year every year for the past decade would have seen their investments grow by a third, whereas those who invested on the last day would have seen them rise by a quarter.	Coles zegt dat iemand die de afgelopen tien jaar elk jaar op de eerste dag van het belastingjaar belegde, zijn beleggingen met een derde zou hebben zien groeien, terwijl iemand die op de laatste dag belegde, zijn beleggingen met een kwart zou hebben zien stijgen.
The extra time also allows you to consider your options before putting away your money, instead of feeling any pressure at the end of the year.	De extra tijd geeft u ook de mogelijkheid om uw opties te overwegen voordat u uw geld wegzet, in plaats van de druk te voelen aan het eind van het jaar.
“For those who already own some investments, that means firstly looking at how these are spread across different markets and identifying major gaps that might be worth plugging – such as too little in the UK or Asia, or too much in the US, as well as checking how your existing investments are doing and perhaps deciding whether some might need to be moved,” says Hollands.	"Voor degenen die al enige beleggingen bezitten, betekent dat in de eerste plaats kijken naar hoe deze zijn gespreid over verschillende markten en het identificeren van grote gaten die misschien de moeite waard zijn om te dichten - zoals te weinig in het Verenigd Koninkrijk of Azië, of te veel in de VS, evenals controleren hoe uw bestaande beleggingen het doen en misschien beslissen of sommige moeten worden verplaatst," zegt Hollands.
“Another merit ... it provides scope to drip feed cash into investments over the months ahead, rather than taking one big plunge at the end. Investing in phases, or even monthly, can help iron out some the volatility that can unnerve investors.	"Een ander voordeel ... het biedt de mogelijkheid om in de komende maanden geld in beleggingen te sluizen in plaats van aan het eind één grote sprong in het diepe te maken. Gefaseerd beleggen, of zelfs maandelijks, kan helpen om de volatiliteit die beleggers kan verontrusten wat weg te nemen.

“Regular, bite-size investing becomes a natural and virtuous habit that is both easier on your cash flow and helps remove the influence of emotions and sentiment that can cloud judgment when news headlines are either gloomy, or when over-optimism might lead share valuations into expensive territory.”	"Regelmatig beleggen in hapklare brokken **(1)** wordt een natuurlijke en deugdzame gewoonte die niet alleen gemakkelijker is voor uw cashflow, maar ook helpt om de invloed van emoties en sentimenten weg te nemen die uw oordeel kunnen vertroebelen wanneer de nieuwskoppen somber zijn of wanneer over-optimisme de aandelenwaarderingen naar duur terrein kan leiden."
Tax changes	**Belastingwijzigingen**
The minor changes to the income-tax thresholds in the last budget have come into effect. The personal allowance has risen to £12,570 and will stay there until April 2026, while the £50,000 higher-rate threshold has gone up to £50,270 before freezing. This means anyone close to the thresholds could be tipped over if their wages go up, even in a minor way, so it is worth looking at the options to avoid a higher tax bill.	De kleine wijzigingen in de drempels voor de inkomstenbelasting uit de vorige begroting zijn van kracht geworden **(5)**. De persoonlijke aftrek is gestegen tot 12.570 pond **(8)** en blijft daar tot april 2026, terwijl de drempel van 50.000 pond voor het hogere tarief is gestegen tot 50.270 pond en daarna wordt bevroren. Dit betekent dat iedereen die dicht bij de drempels zit, erover kan vallen als zijn **(3)** loon stijgt, zelfs in geringe mate, dus het is de moeite waard om de opties te bekijken om een hogere belastingfactuur te vermijden.
“This includes making pension contributions, or taking advantage of a salary-sacrifice scheme through work – this is where the government lets you give up a portion of your salary before tax to spend on certain things free of tax, like pensions, childcare vouchers, cycle-to-work,	Het loont dus de moeite om de mogelijkheden te bekijken om een hogere belastingaanslag te vermijden. **(2)** "Je kunt bijvoorbeeld pensioenpremies afdragen of via je werk gebruikmaken van een spaarloonregeling, waarbij de

and technology schemes," explains Coles.	overheid je een deel van je loon vóór belastingen laat afstaan om dat belastingvrij aan bepaalde dingen te besteden, zoals pensioenen, kinderopvangcheques, fiets-naar-werk- en technologieregelingen," legt Coles uit.
The amount you are paid is then reduced and so are your income tax and national insurance contributions.	Het bedrag dat je krijgt uitbetaald wordt dan verlaagd en dat geldt ook voor je inkomstenbelasting en nationale verzekeringspremies.
The lifetime allowance, the amount that you can save for your pension with tax relief, has also been frozen at £1,073,100 until 2026. The advice for people approaching that figure is that they should look at their plans.	De levenslange uitkering **(1 & 8)**, het bedrag dat je met belastingvermindering voor je pensioen kunt sparen, is tot 2026 ook bevroren op £1.073.100. Het advies voor mensen die dat bedrag naderen, is dat ze hun plannen nog eens onder de loep moeten nemen.
"While there are still reasons to exceed the lifetime allowance – for example, where you benefit from a matched employer pension contribution – those at risk of going over the limit should review their savings and investment strategies to make sure they are still suitable," says Tom Selby of AJ Bell.	"Hoewel er nog steeds redenen zijn om de levenslange toelage te overschrijden - bijvoorbeeld wanneer u profiteert van een gematchte pensioenbijdrage van de werkgever - moeten degenen die het risico lopen de limiet te overschrijden hun spaar- en beleggingsstrategieën herzien om er zeker van te zijn dat ze nog steeds geschikt zijn," zegt Tom Selby van AJ Bell.

7.4 Appendix 4: legal-judicial translation

State of _____ Rev. 133EF4E	Staat _____ Rev. 133EF4E
SALES AGREEMENT	**VERKOOPOVEREENKOMST**
This Sales Agreement (this "Agreement") is entered into as of the _____ day of _____, 20_____, by and among/between:	Deze Verkoopovereenkomst **(7)** (deze "Overeenkomst **(7)**") wordt aangegaan op de _____ dag van _____, 20_____, door en tussen:
Seller(s): _____ _____ [Name], located at _____ _____ [Address] (collectively "Seller") and	**Verkoper(s)**: _____ _____ [Naam], gevestigd te _____ _____ [Adres] (gezamenlijk **(1)** "Verkoper") en
Buyer(s): _____ _____ [Name], located at _____ _____ [Address] (collectively "Buyer").	**Koper(s)**: _____ _____ [Naam], gevestigd te _____ _____ [Adres] (gezamenlijk **(1)** "Koper").
Each Seller and Buyer may be referred to in this Agreement individually as a "Party" and collectively as the "Parties."	Naar **(5)** elke Verkoper **(7)** en Koper **(7)** kan in deze Overeenkomst afzonderlijk worden verwezen als een "Partij **(7)**" en gezamenlijk als de "Partijen **(7)**".
1. Sale of Goods. Seller agrees to sell, and Buyer agrees to purchase the following items in the following quantities and at the prices (the "Goods"):	**1. Verkoop van Goederen.** De Verkoper stemt ermee in om de volgende goederen te verkopen en de Koper stemt ermee in om de volgende goederen te kopen in de volgende hoeveelheden en tegen de volgende prijzen (de "Goederen **(7)**"):
Description of Goods **Quantity** **Price Per Unit**	**Omschrijving van de goederen** **Hoeveelheid** **Prijs per eenheid**
Other Details:	Andere details:
2. Purchase Price. Buyer will pay to Seller for the Goods and for all obligations specified in this Agreement, if any, as the full and complete purchase price, the sum of $_____. Unless otherwise stated, (Check one) ☐ Seller ☐ Buyer shall be responsible for all taxes in connection with the purchase of Goods in this Agreement.	**2. Koopprijs.** De Koper zal aan de Verkoper voor de Goederen en voor alle in deze Overeenkomst gespecificeerde verplichtingen, indien van toepassing, als de volledige aankoopprijs, de som van $ _____ betalen **(5)**. Tenzij anders vermeld, (Check one **(1&8)**) ☐ Verkoper ☐ Koper zal **(5)** verantwoordelijk zijn voor alle belastingen in verband met de aankoop van Goederen in deze Overeenkomst.
3. Payment. (Check one)	**3. Betaling.** (Kruis één aan)
Send an invoice. Seller shall invoice Buyer upon the shipment of the Goods. Unless otherwise stated, payment for the Goods is due within _____ days of the date of Seller's invoice, which date will not be before the date of Seller's delivery of the Goods.	**Een factuur sturen.** De Verkoper zal de Koper factureren bij de verzending van de Goederen. Tenzij anders vermeld, is de betaling voor de Goederen verschuldigd binnen _____ dagen na de datum van de factuur van de Verkoper, welke **(5)** datum niet eerder zal zijn dan

	de datum van de levering van de Goederen door de Verkoper.
Late Fee (Check one)	Laattijdige Vergoeding **(7)** (één aankruisen)
A late payment fee will NOT be charged.	Een vergoeding voor te late betaling zal NIET worden aangerekend.
If Buyer fails to make a payment due under this Agreement within _____ days after the payment's due date, Buyer agrees to pay to Seller a late payment fee of (Check one) ☐ $_____ ☐ _____% of the amount due.	Indien de Koper een verschuldigde betaling in het kader van deze Overeenkomst niet uitvoert binnen _____ dagen na de vervaldatum van de betaling, stemt de Koper ermee in om aan de Verkoper een vergoeding voor laattijdige betaling te betalen van (Controleer **(1&8)** één) ☐ $_____ ☐ _____% van het verschuldigde bedrag.
According to a schedule. Payment for the Goods will be by (Check one) ☐ cash ☐ credit or debit card ☐ personal check ☐ cashier's check ☐ money order ☐ credit or debit card ☐ wire transfer ☐ other: _____, according to the following schedule: (Check all that apply)	**Volgens een schema.** Betaling voor de Goederen zal geschieden door **(5)** (Kruis één aan) ☐ contant geld ☐ krediet- of debetkaart ☐ persoonlijke cheque ☐ kascheque ☐ postwissel ☐ krediet- of debetkaart ☐ overschrijving ☐ andere: _____, volgens het volgende schema: (Controleer alles wat van toepassing is)
Amount previously paid by the Buyer. $_____ previously paid by Buyer.	**Bedrag eerder betaald door de Koper.** $_____ eerder betaald door Koper.
Down payment. $_____ upon the execution of this Agreement.	**Aanbetaling.** $_____ bij de uitvoering van deze Overeenkomst.
Payment for the Goods.	**Betaling voor de Goederen.**
Full payment: $_____ upon Buyer's acceptance of the Goods.	Volledige betaling: $_____ bij aanvaarding **(1)** van de Goederen door de Koper.
Installments: $_____ on _____ [Due day of installment payments], until the purchase price has been paid in full.	Termijnen: $_____ op _____ [vervaldag van de termijnbetalingen], totdat de aankoopprijs volledig is betaald.
4. Delivery. (Check one)	**4. Levering.** (Kruis één aan)
☐ Seller will make the Goods available for Buyer pick-up on or before _____, 20_____ at the following address: _____ .	☐ De Verkoper zal de Goederen ter beschikking stellen voor afhaling door de Koper op of vóór _____, 20_____ op het volgende adres: _____ .
☐ Seller shall ship the Goods to Buyer on or before _____, 20_____ to the following address: _____ .	☐ Verkoper zal de Goederen naar de Koper verzenden op of vóór _____, 20_____ naar het volgende adres: _____ .
Shipping Cost (Check one)	Verzendkosten (Controleer één)
☐ Seller will pay for any shipping costs.	☐ Verkoper **(5)** zal eventuele verzendkosten betalen.
☐ Buyer will pay for any shipping costs.	☐ De Koper zal de eventuele verzendkosten betalen.
Right of Inspection (Check one)	Inspectierecht (Controleer er één)
☐ It shall constitute an acceptance of delivery of the Goods once Buyer has picked up the Goods at the specified location.	☐ Het **(5)** zal een aanvaarding van levering van de Goederen uitmaken zodra de Koper de Goederen heeft afgehaald op de aangegeven locatie.

☐ It shall constitute an acceptance of delivery of the Goods once Buyer has received the Goods at the specified location.	☐ Het vormt een aanvaarding van levering van de Goederen zodra Koper de Goederen heeft ontvangen op de aangegeven locatie.
5. Risk of Loss. Title to and risk of loss of the Goods shall pass to Buyer upon: (Check one)	**5. Risico van Verlies**. De eigendom van en het risico voor verlies **(5)** van de Goederen gaan over op de Koper op **(1)**: (één aankruisen)
☐ Shipment of the Goods in accordance with this Agreement.	☐ Verzending van de Goederen in overeenstemming met deze Overeenkomst.
☐ Delivery of the Goods to Buyer in accordance with this Agreement.	☐ Levering van de Goederen aan Koper in overeenstemming met deze Overeenkomst.
6. Right of Inspection. (Check one)	**6. Recht op Inspectie.** (Controleer één)
☐ NO right to inspection. It shall constitute an acceptance of delivery of the Goods once Buyer has received/picked up the Goods at the specified location.	☐ Geen recht op inspectie. Het geldt als aanvaarding van de levering van de Goederen zodra de Koper de Goederen op de aangegeven locatie heeft ontvangen/afgehaald.
☐ Buyer shall be allowed to examine the Goods once received and shall do so within _____ days after the receipt of the Goods. In the event that Buyer discovers any damages, shortages or other nonconformance of the Goods, Buyer shall notify Seller within _____ days after receipt of the Goods, specifying the basis for its claim. Failure to notify Seller by such date shall constitute an acceptance of delivery of the Goods as is. In the event the Goods are non-conforming, Buyer may at its option: (Check all that apply)	☐ Koper heeft het recht om de Goederen na ontvangst te inspecteren en zal dit doen binnen _____ dagen na de ontvangst van de Goederen. In het geval dat de Koper enige schade, tekorten of andere non-conformiteit van de Goederen ontdekt, dient de Koper de Verkoper binnen _____ dagen na ontvangst van de Goederen op de hoogte te brengen, met vermelding van de basis voor zijn vordering. Indien de Koper de Verkoper niet binnen deze termijn op de hoogte brengt, houdt dit in dat hij de levering van de Goederen aanvaardt zoals ze zijn. In het geval dat de Goederen niet conform zijn, kan de Koper naar eigen goeddunken (Vink aan wat van toepassing is)
☐ Return the Goods for a replacement, at Seller's expense	☐ De Goederen terugzenden voor vervanging, op kosten van de Verkoper
☐ Return the Goods at Seller's expense for a credit of the full purchase price on future transactions with Seller	☐ De Goederen op kosten van de Verkoper retourneren voor een krediet van de volledige aankoopprijs op toekomstige transacties met de Verkoper
☐ Return the Goods at Seller's expense for a full refund of the purchase price	☐ De Goederen op kosten van de Verkoper retourneren voor een volledige terugbetaling van de aankoopprijs
The above shall be the sole remedy of Buyer and only obligation of Seller with respect to any non-conforming Goods.	Het bovenstaande zal het enige rechtsmiddel van de Koper en de enige verplichting van de Verkoper zijn met betrekking tot niet-conforme Goederen.
7. Warranties. (Check one)	**7. Garanties.** (Kruis één aan)
☐ NO warranties, selling the goods “as is.” Buyer acknowledges that it has not relied on, and Seller has not made, any representations or warranties with respect to the quality or condition of the Goods, and it is purchasing the Goods on an “as is” basis. Seller expressly disclaims all warranties, whether express or implied, including any implied warranty of merchantability or fitness.	☐ Geen **(7)** garanties, verkoop van de goederen "zoals ze zijn". Koper erkent dat hij niet heeft vertrouwd op, en dat de Verkoper geen verklaringen of garanties heeft gegeven met betrekking tot de kwaliteit of de staat van de Goederen, en dat hij de Goederen koopt op een "as is" basis **(1)**. De Verkoper wijst uitdrukkelijk alle garanties af, hetzij expliciet of impliciet, met inbegrip van elke impliciete garantie van verkoopbaarheid of geschiktheid.
☐ YES, the seller provides warranties. Seller gives a _____ day limited warranty from the date of delivery that the Goods are in good	☐ JA, de verkoper biedt garanties. De Verkoper geeft een beperkte garantie van _____ dagen vanaf de datum van levering dat de

condition and shall be free from substantive defects. The warranty does not apply to any Goods that are damaged due to the misuse, abuse or negligence of any party other than Seller.	Goederen in goede staat zijn en vrij zullen zijn van wezenlijke gebreken **(5)**. De garantie is niet van toepassing op Goederen die beschadigd zijn ten gevolge van misbruik, verkeerd gebruik of nalatigheid van een andere partij dan de Verkoper.
☐ Other type of warranty: _____	☐ Andere vorm van garantie: _____
8. Security Interest. Buyer hereby grants to Seller a security interest in the Goods, until Buyer has paid Seller in full for the Goods. Buyer shall sign and deliver to Seller any document needed to perfect the security interest in the Goods that Seller reasonably requests.	**8. Zekerheidsbelang.** De Koper verleent hierbij aan de Verkoper een zekerheidsrecht **(5)** op de Goederen, totdat de Koper de Verkoper volledig heeft betaald voor de Goederen. De Koper zal elk document ondertekenen en aan de Verkoper bezorgen dat nodig is om het zekerheidsrecht op de Goederen te perfectioneren **(1)** en dat de Verkoper redelijkerwijs vraagt.
9. Seller Representations and Warranties. Seller warrants that the goods are free, and at the time of delivery will be free, from any security interest or other lien or encumbrance. Seller warrants that there are no outstanding titles or claims of title hostile to the rights of Seller in the Goods.	**9. Verkoper Vertegenwoordigingen (7) en Garanties (7).** Verkoper garandeert dat de goederen vrij zijn, en op het moment van levering vrij zullen zijn, van enig zekerheidsrecht of ander retentierecht of bezwaring. Verkoper garandeert dat er geen uitstaande titels of claims van eigendomsrechten zijn die vijandig zijn aan de rechten van Verkoper op de Goederen.
10. Force Majeure. Seller shall not be responsible for any claims or damages resulting from any delays in performance or for non-performance due to unforeseen circumstances or causes beyond Seller's reasonable control.	**10. Overmacht.** De Verkoper is niet verantwoordelijk voor vorderingen of schade als gevolg van vertragingen in de uitvoering of voor niet-nakoming als gevolg van onvoorziene omstandigheden of oorzaken buiten de redelijke controle van de Verkoper.
11. Limitation of Liability. Seller will not be liable for any indirect, special, consequential, or punitive damages (including lost profits) arising out of or relating to this Agreement or the transactions it contemplates (whether for breach of contract, tort, negligence, or other form of action) and irrespective of whether Seller has been advised of the possibility of any such damage. In no event will Seller's liability exceed the price paid by Buyer to Seller for the Goods giving rise to the claim or cause of action.	**11. Beperking van Aansprakelijkheid (7).** De Verkoper is niet aansprakelijk voor indirecte schade, bijzondere schade, gevolgschade of bestraffende schade (met inbegrip van gederfde winst) die voortvloeit uit of verband houdt met deze Overeenkomst of de transacties die daarin worden overwogen (ongeacht of er sprake is van contractbreuk, onrechtmatige daad, nalatigheid of een andere vorm van actie) en ongeacht of de Verkoper op de hoogte is gebracht van de mogelijkheid van dergelijke schade. In geen geval zal de aansprakelijkheid van de Verkoper hoger zijn dan de prijs die door de Koper aan de Verkoper werd betaald voor de Goederen die aanleiding hebben gegeven tot de vordering of oorzaak van de actie.
12. Assignment. (Check one)	**12. Overdracht. (Controleer één)**
☐ SELLER needs permission to assign to a third party. Seller may not assign any of its rights under this Agreement or delegate any performance under this Agreement, except with the prior written consent of the Buyer. Any purported assignment of rights or delegation of performance in violation of this section is void.	☐ De Verkoper **(7)** heeft toestemming nodig om aan een derde partij over te dragen. De Verkoper mag geen van zijn rechten op grond van deze Overeenkomst overdragen of een prestatie op grond van deze Overeenkomst delegeren, tenzij met de voorafgaande schriftelijke toestemming van de Koper. Elke beweerde overdracht van rechten of delegatie van prestaties in strijd met dit artikel is nietig.
☐ BUYER needs permission to assign to a third party. Buyer may not assign any of its rights under this Agreement or delegate any performance	☐ De Koper **(7)** heeft toestemming nodig om aan een derde over te dragen. De Koper mag geen van zijn rechten op grond van deze

under this Agreement, except with the prior written consent of the Seller. Any purported assignment of rights or delegation of performance in violation of this section is void.	Overeenkomst overdragen of enige prestatie op grond van deze Overeenkomst delegeren, tenzij met de voorafgaande schriftelijke toestemming van de Verkoper. Elke beweerde overdracht van rechten of delegatie van prestaties in strijd met deze paragraaf is nietig.
☐ BOTH Seller and Buyer need permission to assign to a third party. Either Party may not assign any of its rights under this Agreement or delegate any performance under this Agreement, except with the prior written consent of the other Party. Any purported assignment of rights or delegation of performance in violation of this section is void.	☐ Zowel **(7)** de Verkoper als de Koper hebben toestemming nodig om aan een derde partij over te dragen. Geen van beide Partijen mag rechten uit hoofde **(8)** van deze Overeenkomst overdragen of prestaties uit hoofde van deze Overeenkomst delegeren, tenzij met de voorafgaande schriftelijke toestemming van de andere Partij. Elke beweerde overdracht van rechten of delegatie van prestaties in strijd met deze sectie is nietig.
☐ Either Party do NOT need permission to assign its rights to a third party.	☐ Beide partijen hebben GEEN toestemming nodig om hun rechten aan een derde partij over te dragen.
13. Amendments. No amendment to this Agreement will be effective unless it is in writing and signed by both Parties.	**13. Wijzigingen.** Geen enkele wijziging van deze Overeenkomst zal van kracht zijn tenzij zij schriftelijk **(1)** is en door beide Partijen is ondertekend.
14. Governing Law. The terms of this Agreement shall be governed by and construed in accordance with the laws of the State of _____, not including its conflicts of law provisions.	**14. Toepasselijk recht.** De voorwaarden van deze Overeenkomst worden beheerst door en geïnterpreteerd in overeenstemming met de wetten van de staat _____, met uitzondering van de bepalingen inzake conflicten van recht.
15. Disputes. Any dispute arising from this Agreement shall be resolved through: (Check one)	**15. Geschillen.** Elk geschil dat voortvloeit uit deze Overeenkomst zal worden beslecht door: (Controleer één)
☐ Court litigation. Disputes shall be resolved in the courts of the State of _____.	☐ Rechtszaak. Geschillen worden beslecht in de rechtbanken van de staat _____.
(Check if applicable)	(Controleer indien van toepassing)
☐ If either Party brings legal action to enforce its rights under this Agreement, the prevailing party will be entitled to recover from the other Party its expenses (including reasonable attorneys' fees and costs) incurred in connection with the action and any appeal.	☐ Indien een van de partijen een rechtszaak aanspant om haar rechten uit deze overeenkomst af te dwingen, heeft de winnende partij het recht om haar kosten (inclusief redelijke advocatenhonoraria en kosten) die zij in verband met de rechtszaak en een eventueel beroep heeft gemaakt, op de andere partij te verhalen.
☐ Binding arbitration. Binding arbitration shall be conducted in accordance with the rules of the American Arbitration Association.	☐ Bindende arbitrage. Bindende arbitrage zal worden uitgevoerd in overeenstemming met de regels van de American Arbitration Association.
☐ Mediation.	Bemiddeling.
☐ Mediation, then binding arbitration. If the dispute cannot be resolved through mediation, then the dispute will be resolved through binding arbitration conducted in accordance with the rules of the American Arbitration Association.	Bemiddeling, vervolgens bindende arbitrage. Indien het geschil niet door bemiddeling kan worden opgelost, zal het geschil worden opgelost door bindende arbitrage die wordt uitgevoerd in overeenstemming met de regels van de American Arbitration Association.
16. Entire Agreement. This Agreement contains the entire understanding between the Parties and supersedes and cancels all prior agreements of the Parties, whether oral or written, with respect to such subject matter.	**16. Gehele Overeenkomst.** Deze Overeenkomst bevat de volledige overeenstemming tussen de Partijen en vervangt en annuleert alle voorgaande overeenkomsten van de Partijen, mondeling of schriftelijk, met betrekking tot dit onderwerp.
17. Notices. Any notice or other communication given or made to any Party under this Agreement	**17. Kennisgevingen.** Kennisgevingen of andere mededelingen die op grond van deze

shall be in writing and delivered by hand, sent by overnight courier service or sent by certified or registered mail, return receipt requested, to the address stated above or to another address as that Party may subsequently designate by notice and shall be deemed given on the date of delivery.	Overeenkomst aan een Partij worden gedaan **(1)** of gedaan, dienen schriftelijk te geschieden en persoonlijk te worden overhandigd, te worden verzonden per overnight **(1)** koeriersdienst of te worden verzonden per gecertificeerde of aangetekende post, met bewijs van ontvangst, aan het hierboven vermelde adres of aan een ander adres dat die Partij vervolgens per kennisgeving kan aanwijzen, en worden geacht te zijn gedaan op de datum van bezorging.
18. Waiver. No Party shall be deemed to have waived any provision of this Agreement or the exercise of any rights held under this Agreement unless such waiver is made expressly and in writing. Waiver by any Party of a breach or violation of any provision of this Agreement shall not constitute a waiver of any other subsequent breach or violation.	**18. Verklaring van afstand.** Geen enkele Partij wordt geacht afstand te hebben gedaan van enige bepaling van deze Overeenkomst of van de uitoefening van enige rechten uit hoofde van deze Overeenkomst, tenzij een dergelijke afstand **(1)** uitdrukkelijk en schriftelijk is gedaan. Afstand door een Partij van een inbreuk op of schending van een bepaling van deze Overeenkomst houdt geen afstand in van enige andere daaropvolgende inbreuk of schending.
19. Miscellaneous. This Agreement shall be binding upon and inure to the benefit of the Parties and their respective heirs, successors and assigns. The provisions of this Agreement are severable. If any provision is held to be invalid or unenforceable, it shall not affect the validity or enforceability of any other provision. The section headings herein are for reference purposes only and shall not otherwise affect the meaning, construction or interpretation of any provision of this Agreement. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original and all of which together, shall constitute one and the same document.	**19. 19. (2) Diversen.** Deze Overeenkomst is bindend voor en komt ten goede aan de Partijen en hun respectieve erfgenamen, opvolgers en rechtverkrijgenden. De bepalingen van deze Overeenkomst zijn scheidbaar. Indien een bepaling ongeldig of niet-afdwingbaar wordt geacht, zal dit geen invloed hebben op de geldigheid of afdwingbaarheid van andere bepalingen. De sectiekopjes in deze Overeenkomst dienen uitsluitend ter referentie en hebben geen andere invloed op de betekenis, constructie of interpretatie van enige bepaling in deze Overeenkomst. Deze Overeenkomst kan worden uitgevoerd in één of meer exemplaren, waarvan elk wordt beschouwd als een origineel en die tezamen één en hetzelfde document vormen.
20. Other. _____ _____	**20. Overige.** _____ _____
RIGHT TO CANCEL (Check one)	RECHT TOT ANNULEREN (Kruis één aan)
☐ YOU, THE BUYER, MAY CANCEL THIS TRANSACTION AT ANY TIME PRIOR TO MIDNIGHT OF THE THIRD BUSINESS DAY AFTER THE DATE OF THIS TRANSACTION.	☐ U, DE KOPER, KUNT DEZE TRANSACTIE OP ELK MOMENT VÓÓR MIDDERNACHT VAN DE DERDE WERKDAG NA DE DATUM VAN DEZE TRANSACTIE ANNULEREN.
☐ THE BUYER DOES NOT HAVE THE STATUTORY RIGHT TO CANCEL THIS TRANSACTION.	☐ DE KOPER HEEFT NIET **(5)** HET WETTELIJKE RECHT OM DEZE TRANSACTIE TE ANNULEREN.
IN WITNESS WHEREOF, the Parties have executed this agreement as of the date first written above.	**TEN BLIJKE WAARVAN** de partijen deze overeenkomst hebben ondertekend op de datum die hierboven het eerst is geschreven.
Buyer Signature	Handtekening **koper**
Buyer Full Name	Volledige naam **koper**
Buyer Signature	Handtekening **koper**
Buyer Full Name	Volledige naam **koper**
Seller Signature	Handtekening **verkoper**
Seller Full Name	Volledige naam **verkoper**
Seller Signature	Handtekening **verkoper**
Seller Full Name	Volledige naam **verkoper**