Kaunas University of Technology

Faculty of Social Sciences, Arts and Humanities

Light Machine Translation Post-Editing Effort and Quality Evaluation of News Texts Translated from English to Lithuanian

Master's Final Degree Project

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Kaunas University of Technology

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Translation and Post-editing of Technical Texts (6211NX031)

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Summary

Light Machine Translation Post-Editing Effort and Quality Evaluation of News Texts Translated from English to Lithuanian**.** The relevance of the topic. The novelty of this work is based on the fact that in the digital age machine translation (MT) is seen integrated into various platforms, technologies, and programs. Advancements of MT enhanced the overall capabilities of machine translation systems with neural machine translation framework providing higher quality outputs. To make the quality as best as possible, post-editing, defined as human processing of MT output, is applied. Such text processing practice increased in usage because of MT improvement. However, issues are still found in the mentioned output, proving the necessity of post-editing, in order to ensure error-free text, thus post-editing plays a crucial role ensuring the overall quality of the translated text, despite the MT quality. The object of this research is machine translation and post-editing. The aim of this research is to conduct a study on light machine translation post-editing effort and quality of news texts translated from English to Lithuanian. To achieve the aim of this study, four objectives are presented as follows: to overview theory regarding machine translation, post-editing, low-resource languages, and issues of machine translation post-editing; to examine the overall relevance of news and translation process of news content; to determine translators' views towards MT and MTPE practices via a survey; to carry out a post-editing task to find out if whether light post-editing is sufficient for news text genre editing with current MT technology. The structure of this research consists of theoretical part, focusing on machine translation, post-editing, research done in the field, post-editing guidelines and overview of overall relevance of news, methodological part, in which explanation of how the research was conducted, analysis of the research, in which analysis of the findings is visualised, and conclusions.

After conducting the research, it can be said that, that theoretical exploration emphasizes the importance of human translator processing of MT, despite the progress of machine translation. Challenges, that affect the process of post-editing implies the necessity for further advancement of MT. Talking about news, a field that has been highly influenced by digitalization, it relies on such post-editing processes to improve the speed of news presentation, as MT quality is not sufficient alone to be presented to public. Following the survey, concerns among translators are seen, that mainly focus on poor quality of MT and low pay rates for post-editing task completion. High dependence on MT is highlighted as task completion speed and effort is dependent on quality of output that MT system produces.

Even though translation of news articles with MT is possible, full post-editing practices must be applied for such texts to be good quality wise. Continuing, the analysis of task, which was done by translators, highlights the complexity of time and quality evaluation. Differences between translators are visible in terms of quality and efficiency, with various approaches chosen to address the issues presented in the task. All in all, full post-editing practices need to be applied when post-editing news texts due to limitations of light post-editing guidelines and insufficient MT quality.

After the conducted study, it can be said further investigation of MT output is needed, specifically in EN-LT-EN language combination, as survey distinguishes current drawbacks of MTPE tasks in the mentioned language combination. Investigation and liquidation of such drawbacks would improve the general process of post-editing practices. Secondly, post-editing practices of specific fields texts still need further investigation and research towards how such processes could be improved. All these mentioned could be done based on research presented in this thesis.

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Santrauka

Naujienų, išverstų iš anglų į lietuvių kalbą, mašininio vertimo paviršinio postredagavimo pastangų ir kokybės vertinimas. Šio darbo naujumas grindžiamas tuo, kad skaitmeniniame amžiuje mašininis vertimas (MV) yra integruotas į įvairias platformas, technologijas ir programas. Patobulinus MV, patobulėjo bendrosios mašininio vertimo sistemų galimybės, o neuronine mašininio vertimo sistema (angl. *Neural machine translation framework*) užtikrinami aukštesnės kokybės rezultatai. Siekiant geresnės kokybės, taikomas postredagavimas, kuris apibrėžiamas kaip žmogaus atliekamas MV rezultatų apdorojimas. Toks teksto apdorojimas vis dažniau taikomas dėl MV kokybės tobulėjimo. Tačiau, minėtuose rezultatuose vis dar aptinkama trūkumų, o tai parodo, kad, siekiant užtikrinti, kad tekstas bus be klaidų, būtina atlikti postredagavimą. Tokiu būdu, nepaisant MV kokybės, postredagavimas išlieka labai svarbus užtikrinant bendrą išversto teksto kokybę. Šio tyrimo objektas yra mašininis vertimas ir postredagavimas. Šio tyrimo tikslas yra atlikti paviršinio mašininio vertimo postredagavimo pastangų ir kokybės tyrimą analizuojant naujienų tekstus, išverstus iš anglų į lietuvių kalbą. Pagrindiniai darbo uždaviniai yra aptarti teoriją, susijusią su mašininiu vertimu, postredagavimu, mažai išteklių turinčiomis kalbomis ir mašininio vertimo postredagavimo problemomis. Taip pat išnagrinėti bendrą naujienų aktualumą ir naujienų turinio vertimo procesą, apklausos būdu nustatyti vertėjų požiūrį į MV ir MVPR praktiką ir atlikti postredagavimo užduotį, siekiant išsiaiškinti, ar paviršinio postredagavimo užtenka redaguojant naujienų tekstą naudojantis dabartinėmis MV technologijomis. Šio tyrimo struktūrą sudaro teorinė dalis, kurioje daugiausia dėmesio skiriama mašininiam vertimui, postredagavimui, šioje srityje atliktiems moksliniams tyrimams, postredagavimo gairėms ir bendro naujienų aktualumo apžvalgai, metodologinė dalis, kurioje paaiškinama, kaip buvo atliktas tyrimas, tyrimo analizė, kurioje pateikiama rezultatų analizė, ir išvados.

Atlikus tyrimą, galima teigti, kad, nepaisant mašininio vertimo patobulinimo, teorijoje išskiriama žmogaus vertėjo, atliekančio MV apdorojimą, svarba. Iššūkiais, kuriais daroma įtaką postredagavimo procesui, parodoma būtinybė toliau tobulinti MV. Kalbant apie naujienas, sritį, kuriai didelę įtaką padarė skaitmeninimas, pastarosios yra paremtos postredagavimo procesais, kad tokiu būdu būtų pagerintas naujienų pateikimo greitis, o MV kokybė nėra pakankamai gera, kad būtų galima naujienas pateikti visuomenei be postredagavimo.

Atlikus apklausą, paaiškėjo vertėjams kylančios problemos, kurios daugiausia susijusios su prasta MV kokybe ir mažais atlyginimais už postredagavimo užduočių atlikimą. Pabrėžiama didelė tokių užduočių priklausomybė MV sistemoms, nes užduočių atlikimo greitis ir pastangos priklauso nuo MV sistemos pateikiamos išvesties kokybės. Nors naujienų straipsnių vertimas naudojant MV yra įmanomas, tačiau norint, kad tokie tekstai būtų kokybiški, būtina taikyti visapusišką postredagavimo praktiką. Kalbant apie užduoties, kurią atliko vertėjai, analizę, išryškėja laiko ir kokybės vertinimo sudėtingumas. Tarp vertėjų pastebimi kokybės ir efektyvumo skirtumai, o užduotyje pateiktoms problemoms spręsti pasirenkami įvairūs metodai. Galima daryti išvadą, kad atliekant naujienų tekstų postredagavimą reikia taikyti visapusišką postredagavimo praktiką dėl paviršinio postredagavimo gairių ribotumo ir nepakankamos MV kokybės.

Po atlikto tyrimo galima teigti, kad reikia toliau tirti MV išvesties kokybę, ypač EN-LT-EN kalbų derinyje, nes tyrime išskirti dabartiniai MVPR užduočių trūkumai. Tokių trūkumų likvidavimas pagerintų bendrą postredagavimo praktikos procesą. Antra, konkrečių sričių tekstų postredagavimo praktiką vis dar reikia toliau tirti ir nagrinėti, siekiant išsiaiškinti kaip tokius procesus būtų galima patobulinti. Visa tai būtų galima atlikti remiantis šiame darbe pateiktais tyrimais.

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List of abbreviations

Abbreviations:

ISO – International Organization for Standardization

LRL – Low-Resource Language

LSP **–** Language service provider

MT – Machine translation

MTPE – Machine translation post-editing

NMT – Neural machine translation

ST – Source text

TAUS – Translation Automation User Society

TT – Target text

Introduction

Cross-linguistic communication has been transformed by machine translation, yet translating from English to Lithuanian is still difficult. Machine translations into Lithuanian frequently have errors due to the language's insufficient databases and linguistic related issues. Enhancing the fluency, overall quality and readability of machine translations requires post-editing, which is human-processed evaluation and revision of the mentioned translations. During post-editing procedure, it is important to pay close attention to ambiguities, idioms, and context-dependent sentences. Professional translators manage to produce good and natural-like translation into Lithuanian while maintaining the meaning of the original text. Post-editing improves translations' overall quality while addressing Lithuanian to English machine translation' benefits and drawbacks and promoting efficient cross-linguistic communication.

The aim of this research is to conduct a study on light machine translation post-editing effort and quality of news texts translated from English to Lithuanian.

The object of this research is machine translation and post-editing practices.

Objectives:

1. To overview theory regarding machine translation, post-editing, low-resource languages, and issues of machine translation post-editing.
2. To examine the overall relevance of news and translation process of news content.
3. To determine translators' views towards MT and MTPE practices via a survey.
4. To carry out a post-editing task to find out if whether light post-editing is sufficient for news text genre editing with current MT technology.

Relevance and Importance of the Research. Machine translation is widely used in this age of digitalization. It is found everywhere, in smartphones, internet exploring software's, cultural sites, where usually descriptions are being translated with the use of MT systems. It is easy enough to use frequently, as it only needs a source text and language combination. With the advancements made in the field of AI, it is now integrated into MT translation for additional aid and to develop itself (the system) for a higher quality result. Post-editing, described according to TAUS as "The process of improving a machine-generated translation with a minimum of manual labour" (Massardo et al., 2016) of such texts, has been used as early as the 1980s, for example, by European Commission, but despite that it only gained significant relevance in the last 15 to 20 years because of the neural machine translation (NMT) system, which is considered to provide highest quality of MT translation output compared to pre-successors like statistical MT systems or rule-based MT systems and it is only natural that such system would impact post-editing sector (Pérez, 2024). Now post-editing is highly integrated into the workflow of a translator. Such workflow may be interpreted as a help for a translator to translate specific texts, but not all translators agree on such addition. Machine translated text may be considered decent quality wise, but it is not perfect as disagreements arise on the same factor – quality (Arenas, 2019).

The main issue of working with machine translation is that the quality of the MT output could need light post-editing or full post-editing as errors in MT output are found despite it being highly developed. Post-editing procedure ensures that the translation would be both error-free and linguistically sound and it is designed to close the gap between human translation and automatic translation. It entails the manual editing and revision of machine translations, which is done by linguists or translators experienced in the target language. When working with difficult languages, idiomatic phrases, cultural subtleties, and context-dependent interpretations, the significance of post-editing becomes even more clear. For machine translation systems, these nuances provide difficulties, which might result in translations that are incorrect or without crucial contextual information. By applying post-editing procedures and rules, post-editors may overcome these difficulties and produce accurate, and culturally acceptable translations.

Research methods used in this study are analytical, qualitative, descriptive, quantitative analysis, and comparative research methods.

1. Machine translation

This section covers machine translation history. Additionally, MT mainframes are discussed. Primary focus is devoted to post-editing.

Machine translation has been around for a long time and is indeed particularly useful in the digital world. It can be defined as a computer-assisted tool which can automatically translate any sentence from one language to another (language options may differ from one MT program to another).

The history of machine translation, or the technique of employing computers to mechanically translate text from one language to another, is interesting. Machine translation may be traced back to the mid-twentieth century, when academics began looking into the idea of using computer methods to disassemble language barriers. To aid the translation process, linguists developed comprehensive compute sets of grammar and translation rules. These systems, on the other hand, struggled to comprehend the nuances and complexity of language. Statistical machine translation emerged in the 1990s, generating translations based on statistical patterns using vast bilingual corpora. This approach improved, although it still had limitations. With the introduction of deep learning and neural networks, a paradigm changes in machine translation have happened. Models of neural machine translation, such as sequence-to-sequence models and transformer architectures, have transformed the discipline by allowing for more accurate and fluid translations.

Today, machine translation is advancing quickly, aided by continuing research and the availability of massive volumes of multilingual data (Hutchins, 2006). One of the most major advantages of machine translation in the twenty-first century is that it can now be used anywhere because it now works with smartphones, and it can help you interpret any sentence, written or spoken (via a voice to text application). However, it not only aids people who seek translation, but it also simplifies the translator's work. Many programs include MT applicability, such as *Wordfast Anywhere*, *SDL Trados*, or *memoQ*, but those programs are not efficient enough to do the translation on their own. Expressions, discourses, and many other factors are usually translated incorrectly by MT, so the translator should always keep an eye out for MT errors (Kasperavičienė, Motiejūnienė, and Patašienė, 2020). It is worth noting that MT systems are categorized by systematic models (mainframes), that differ by their internal rules and datasets.

Mainly discussed mainframes are four: rule-based, statistical, hybrid (combining the two mentioned) and neural machine translation systems. Rule-based machine translation system is based on glossaries, dictionaries and similar datasheets that provide grounds for the system to translate (Okpor, 2014). This system also has its drawbacks: based on such datasets like dictionaries and glossaries, its capacity to stay relevant and useful is strongly dependent on the mentioned factors, as building such datasets is expensive, not to mention the input of linguistic information input, as no such datasets are applied into the system automatically, it has to be done manually, thus the effort to prepare such system becomes increasingly hard and the output is still limited to what is done. Successor of rule-based machine translation system is statistical machine translation or SMT for short. This system mainframe differs from the mentioned because it does not look at the task the same way rule-based MT does. Its goal is to treat translation task as a problem, which needs to be solved (Lopez, 2008). As the name suggests, this system is based on statistics and mathematical computing seeking to solve equations (in this instance, translation tasks) on the basics of large corpus and data.

One distinct benefit of this system is that it learns from every experience it encounters, meaning that information is stored each time it prepares the output, no matter the quality. This benefit can also be considered as a disadvantage as output varies in quality as it cannot produce good translations each time. Another disadvantage of statistical system is that it has limited approach and understanding of context matters as computing and statistics rely on facts (displayed text) but not on the deeper meaning of sentences (Okpor, 2014). To perfect the mentioned systems, hybrid MT system was created, combining the rules and statistics for better output. Such hybrid system combines the advantages of rule-based and statistical machine translation systems, making it based on rules and equations. Rules are implemented structure sentences according to various rules, such as grammatical, syntactic etc. while statistical data is applied for search and application of probabilistic patterns seeking highest available quality. Biggest drawback of such system is its complexity as it required vast amounts of effort in preparation for such system to work, not to mention expensive. Last system to discuss is neural machine translation (NMT) system, which is considered up to date, as few of the most-known machine translation systems like *DeepL* and *Google translate* are run by such mainframe. NMT is based on training of such system and application of self-learning afterwards. It involves huge datasets, which are used for training and preparation of such system, even though it is expensive (Wu et al., 2016). Such NMT systems are advanced and produces high-quality output, but the output is dependent on involved datasets, its quality and quantity.

To conclude what has been said, machine translation has been in developing since early 19th century, with different MT mainframes developed to seek perfection in output. Such development led to creation of neural machine translation systems enhancing efficiency of post-editing practices.

1.1. Post-editing: guidelines and research insight

Post-editing is a procedure for machine translated texts and is done after the output has been provided by machine translation software. It entails editing and improving the quality of machine-translated content to make it more accurate, natural-sounding, and appropriate for the target audience. This procedure is done by a human translator, who reviews the generated output and makes corrections to ensure quality (Vieira, 2019). In professional context, MT generated output must be post-edited to reach needed quality level.

The amount of post-editing needed varies according to the quality of the machine translation and the intended use of the translated content. Minor corrections may be required in some cases, while significant revisions may be required in others to ensure that the translation is accurate and reads naturally in the target language.

For instance, expert translators and freelance translators can do post-editing. As machine translation technology improves, the use of post-editing is becoming more popular.

It is worth noting that working with MTPE has its benefits against translating without MT:

- consistency: machine translation engines can maintain consistency in terminology and style throughout the translation. This is particularly beneficial when working on large projects or documents with repetitive content.

- improved quality: while machine translations may not produce quality output each time, they can still provide a reasonable starting point. Translators can use suggestions that MT proposes, correcting and editing them to ensure accurate and high-quality translations.

- increased productivity: machine translation can significantly speed up the translation process by providing a draft translation that can be post-edited. Instead of starting from scratch and searching for information, translators can use the machine translation output as a starting point, correct it and thus save time and effort (Arenas et al., 2012).

While machine translation has its benefits towards post-editing, it also has disadvantages:

- quality variation: machine translation systems can produce inconsistent quality across different language pairs, which could result in increase of needed post-editing.

- contextual understanding: systems lack the ability to fully comprehend the context and background information that human translators possess. This can lead to misinterpretations and errors in the machine-generated translation.

- loss of translator creativity: working with machine-generated content in the post-editing process can limit the translator's creative input. Translators may feel restricted in terms of adapting the translation to the target audience, applying a preferred writing style, or using their expertise to provide a more nuanced and culturally appropriate translation. (Nitzke, & Hansen-Schirra, 2021).

It is worth explaining that post-editing, in most cases, is divided into two main types of work: light and full post-editing.

Light post-editing is referred to as “rapid post-editing” (RPE). As the title clarifies, this method of post-editing involves least amount of effort put in the work (Temizöz, 2013). The point of this method is to make the content understandable enough, but it can still contain some mistake as some factors are not considered. According to Juan Rowda (2015), RPE is used to remove major errors and ambiguities that occur in the text to make it just enough to fully understand. Most of the authors, who write about light post-editing have the usually the same view of this matter (Hu & Cadwell, 2016).

Full post-editing is quite different from light post-editing in terms of what factors are considered when full post-editing. As Chun Ting Man, author of *Post-editing at work* (2019) states, full post-editing demands uttermost attention to the details and smallest mistakes to be fixed, to seek perfection for a text to be perfect and without any mistakes.

TAUS (2018) created a table highlighting guidelines for post-editing work of each type. For light post-editing, the sentences need to be only semantically correct after post-editing procedure. This means, that no other aspect needs to be considered, for example, the sentence does not need to be grammatically correct. On the other hand, the text after full post-editing needs to be not only semantically but grammatically and syntactically correct, which when compared shows that full post-editing needs to be perfect in the view of presented rules. Talking about spelling and other general rules, basic rules of spelling need to be applied to both types, but when doing full post-editing, the editor needs to apply punctuation and hyphenation rules. This guideline represents how much effort needs to be done when applying full post-editing and contrasts it with light post-editing.

It is important to note that one guideline is specifically directed to client's input, which is to ensure that terminology is correct and to check if there are no translated words that client marked as "Do not translate", meaning that full post-editing type also adds clients' instructions into equation, leaving the editor with more needed effort to ensure full post-editing quality. Another guideline, which is exceptional to full post-editing is ensuring the quality of file formatting, which means that after the post-editing is finished, the post-editor needs to ensure that there is no ambiguities or errors in the file itself, like font or its size difference. Light post-editing also has exceptional guidelines that are not applied to full post-editing, for instance, light post-editing does not consider style errors or text "flow" and such errors do not need to be corrected, leaving the text with possible stylistic and unnatural. There are few other guidelines that are applied to both types of post-editing, for example, editing sensitive content, using as much MT as possible and ensuring that there are no omissions or additional (not needed) words in the texts. Both types have their sets of rules that need to be followed not only to ensure how much effort is needed for the output to be ready and deliverable but also to make certain that the output is post-edited by following those mentioned guidelines.

A lot of various post-editing research is made. One research according to this theme was done by Masaru Yamada, who conduced an analysis on Google Translate neural machine translation seeking to examine college students' abilities and to see if they could become post-editors. The author has enrolled 28 students to this analysis, who were to edit 486-word English excerpt from Wikipedia into Japanese. The task was prepared in a Word file format and was given to the students with a deadline of one week. The file consisted of two paragraphs, one to translate ordinarily (as author calls it humanly, or HT, which means human translation), while the other was to post-edit. After completion – a questionnaire needed to be done, consisting of questions about post-editing and to give some open answers about their experience.

Moving over to the results of this research, when students were asked if they found out that post-editing is easier than translating it from scratch (HT), 20 students out of 28 chose to say yes, which shows that MT post-editing was easier and quicker than translating without MT. When talking about the effort needed to post-edit, students were asked to comment this with a numerical rate with the primary score of 100 and their answers would determine if they needed more effort to post-editing than HT or less effort. This resulted in 79.1 % students saying that their post-editing effort was 21 % lower than HT, even though that Google translate output is rated lower in terms of quality than other better quality output producing systems like *DeepL* or *Tilde* (see section 1.1.1 analysis of Povilaitinė, M., and Kasperė, R. study). To sum up the post-editing effort, it can be said that post-editing demands less effort by 21 % than translating without using MT. Secondly, the author decided to determine the amount of editing needed when post-editing the provided texts. He used GTM (General Text Manager) metrics to evaluate the text modified. The value ranges from 0-1, with 1 meaning that the content is by far closest to raw MT output or left the same.

Results of these metrics show that when students edited NMT system output, it required fewer revisions (scored 0.210) compared to HT. This means that NMT output is good and does not need so much editing. Lastly, quality factor was considered by accounting the errors and calculating according to the authors selected error typology. After evaluation, it can be said that NMT output (after post-editing) has made 27 errors in total, which 10 of them are considered major errors, while the rest 17 are attributed to minor error category. (Yamada, 2019). Given the circumstances, Masaru Yamada made interesting research regarding post-editing field, found out how students react to such tasks and evaluated their abilities to cope with such task.

Not only that, but his research also evaluated the output of Google translate NMT system and showed how many errors are done by the mentioned system.

Another research was made by four researchers from Charles University, Faculty of Mathematics and Physics in Czech Republic. This research was made to confirm or deny the hypothesis that MT (language combination EN to CZ) output to post-editing saves time for professional human translators. For evaluation, thirteen different MT translation systems were used, in addition, open-source systems from *Google* and *Microsoft* were taken into the study. All systems were evaluated by BLEU and TER metric systems. Each system had to translate ninety-nine lines (segments, or as the authors call it "tokens") of texts: thirty-three lines of texts were related to news, twenty-nine lines – legal text, twenty-three lines of audit type text and eleven lines of technical documentation. One file, containing the ninety-nine lines was translated by one MT translation system, resulting to one file being translated by no more than one MT system. Texts were edited using *memoQ* as computer assisted translation tool. For post-editing and revision, over thirty professional translators were chosen, who are familiar with the CAT tool and have done this type of work before. The main factors considered in this study is time spent on each segment and quality of the raw output of MT and edited segment lines. Translation process was separated into two stages: post-editing and revision. Firstly, the selected post-editors were given the texts to post-edit, which marked the time needed to post-edit the segments for quality perfection. No MT or other CAT tools were allowed for this process. After the post-editing, seventeen reviewers had an opportunity to check the post-edited content and correct if necessary. This reviewing stage goal was to check how the quality of post-editing MT has an impact to the final translation. The whole procedure and stages resulted to a summary, which shows that MT and post-editing time has its complexity, which is influenced by many factors and cannot be determined side-to-side (Zouhar et al. 2021). To sum up this research, it can be said that time when doing post-editing differentiates each time and factors such as quality of MT systems have a significant impact on it.

To sum up the overviewed studies, this detailed review provides useful information about the post-editing process in the context of MT systems. They underline the need of considered factors such as qualities of machine translation systems (such as *Google translate* and *DeepL*) output, post-editing effort, considering if it is worth it to do such a task and how much effort it needs to produce a completed task, and post-editing time, which indicates how much time it takes to post-edit tasks and if its reasonable compared to translating a task from scratch. Despite the limitations and faults involved with MT output, post-editing remains a viable method for increasing translation efficiency and productivity.

Recapitulating this section, MTPE is a procedure to perfect the output of machine translation system adding a human touch the translation and fixing errors that MT may have produced. To ease such task, specific guidelines like TAUS have been developed overviewing and providing helpful tips and rules how such work can be done. Tailoring to such guidelines provides an outline what to look for and how to post-edit correctly. As reviewed, MTPE field has a lot of research done towards finding out what factors benefit and provide a disadvantage when post-editing. Such studies illuminate what needs to be improved and provides factual results of how much effort does post-editing require.

1.1.1. Low-resource languages and assessment of post-editing studies done in Lithuania

Moving forward from the overview of post-editing and foreign research, the following theoretical overview offers an introduction to low-resource languages, providing explanation and comparison with dominant languages, and post-editing research within the Lithuanian context. The examination of existing studies provides examples of what research is done in Lithuania regarding machine translation post-editing practices.

Although machine translation has extensively developed, it still requires a lot of parallel data for almost 7,000 languages worldwide. Minor languages, or in other terms low-resource language's (LRLs) is as an "under resourced, low density, poor resource, low data or less resourced language" (Ranathunga, et al, 2023). Dominant languages take most of the mentioned parallel resources and leave minor languages behind without the needed resources in which the MT makes issues while translating those languages.

Due to their distinctive traits, low-resource languages provide several issues. These languages frequently have little internet presence or no standardized writing system. They could also be lacking in electronic resources like corpora, vocabulary lists, and paraphrase tools as well as language-specific linguistic skills. For language-related activities like machine translation, natural language processing, and linguistic research, these constraints provide major obstacles. The creation of language-specific tools and resources may be hampered by the absence of a distinctive writing system in LRLs. It becomes challenging to develop consistent dictionaries, language models, and linguistic databases without a uniform orthography. Additionally, it is difficult to collect digital written information for research or training language models due to LRLs' little online presence. The development of language technologies is hampered by the lack of online resources, which also makes trustworthy information difficult to find online. The problems are made more difficult by a lack of LRL-specific linguistic expertise. It may be difficult to conduct in-depth linguistic analysis, create language resources, or offer accurate translations and interpretations because linguists and language specialists who are proficient in these languages may be hard to come by. The absence of electronic resources like monolingual and parallel corpora, vocabulary lists, and paraphrase databases represents another significant barrier. These tools are essential for developing and testing language models, enhancing machine translation programs, and conducting linguistic research. Language technologies for LRLs cannot develop and advance without access to such resources (Ranathunga et al., 2023).

Authors from Al-Farabi Kazakh National University: Rakhimova, D., Karibayeva, A., & Turarbek, A. have analysed post-editing MT of a low resource language. They conducted research of Kazakh language, a low resource language, in means of post-editing the mentioned language. To do this, they firstly identified problems of resources that may be applied not only to Kazakh language:

- morphological complexity. This factor can also be applied to Lithuanian language as well as to Latvian or Estonian. Kazakh language has suffixes and prefixes, also both common in Lithuanian language, which make this language complex and difficult to understand to MT systems. Their morphological systems are unique and different from high resource language, like Russian or English, and research in language field is below minimum when compared.

- another factor is the cultural aspects and idioms. Every language has their own cultural differences and diverse ways to express those cultural aspects, same goes with idioms. To convey the meaning of one's language cultural language or to understand an idiom, deeper research needs to be done. Matter the fact that high resource languages are far more known than low resource languages, making their idioms and cultural differences heard more often than for example low resource languages.

The authors have identified other problems like syntactic differences, Latin script etc. that corelate to most problems when dealing with low resource languages.

To further examine low-resource languages, a group of authors have written a research paper on low-resourced Egyptian dialect in terms of translating it to modern Arabic. The authors have high-lighted the problems that are applied to Egyptian dialect. Firstly, the number of Arabic dialects discloses a problem that ones are better researched than others, meaning that one can be highly-resourced, while others – low-resourced. Another problem discussed is about Arabian languages being morphologically rich, thus meaning that same words are written differently depending on a dialect used in specific location. To overcome these problems and create better MT for the low-resourced Egyptian dialect they have used three different MT approaches (supervised, unsupervised, and semi-supervised), with specific inputs to each approach (adding datasets, different training models etc.). The results of this research concluded that semi-supervised approach (which is a combination of both previous mentioned approaches) was the best model for translating such dialect (Faheem et al., 2024), thus proving that such systems of MT can be overcome and provide quality output if specific established problems are identified and managed.

Another problem that can be identified relating to low resource language is globalization of language. This phenomenon is also known as major languages, such as English, "killing" low-resource languages, while itself dominates the market. Europe is considered to be the main place for this phenomenon to locate. Globalization of language as a term means when one language expands and starts dominating in the region or world. As of today, it is frequent to say that English language is dominating in Europe and in the world, known to be titled as Mother language of the world or in Latin lingua franca (global language). For example, the dominating language in Lithuania is to be considered Lithuanian and Russian languages because of the history between the two countries. Now situation is changing and the main languages in Lithuania are changing. Globalization relates to history as historical aspects (countries having big lands, colonies, etc.) have impacted regions and the language they speak. For example, United States of America in 20th century had worldwide economic growth, which led to their products, services, items, factors related to medicine being spread throughout the world and the main language for communication was English (Pašalić & Marinov, 2008).

These factors all combined pose a treat that comes with the English language. As it was mentioned, language "killing" in Europe is associated with English language, as it moves into different countries and lower the usage of language that people are speaking in that country.

This treat is also affecting the terminology of one's country. For example, most of the medical terms originally come from English language without zero substitute in the original language. Adaptation of words is also common in non-English countries as they are used more frequently and easier understood by a wider community (Pašalić & Marinov, 2008).

The impact of this globalization of languages poses a severe risk of changing the original language, for example, Lithuanian, and damages the low-resource language integrity. Less and less attention is addressed low-research languages as high-resource languages are taking the lead. Nevertheless, such phenomenon does not stop research and studies to be made in such low-resourced languages.

Moving over post-editing research done in Lithuania, Povilaitienė, M. and Kasperė, R. has done research concerning neural machine translation and post-editing practices. First, they have conducted a survey for language service providers (LSPs) and freelance translators. Total amount of respondents: 142 (110 freelance translators and 31 LSPs). The questions asked in the survey were related to MT and post-editing. First question examined is related to the usage of MT in everyday practices of LSPs and freelancers. The outcome of this question shows that most of the freelancers (78) do use MT for everyday work, while other twenty-six said that they do not. LSPs answers have divided almost half: sixteen of them said that they do use MT, while the rest fifteen chose to say that they do not practice MT. As the author motions, the results may suggest that there may be a gap in understanding MT (its benefits, drawbacks, risks). Moving on to the second question, respondents were asked to clarify the reasons for using MT post-editing. Most of respondents chose to say that MT output is poor in terms of quality, indicating that quality does not suit the needs of respondents and may show indication of post-editing time taking more time than translating without using machine translation systems. Moreover, freelance translators had additional question to answer, which was to indicate why they choose to use MT post-editing practice with two answers to choose from: "Upon request from a customer" and "I use MT on my own initiative". First answer got thirty-three responses, while the second one – forty-five. This may as well indicate the increase of MT pre-translated packages being sent out to the translators to post-editing rather than translate without using MT.

Second stage of this study was evaluation of MT quality. Three different MT systems were used: *Tilde*, *Google translate* and *DeepL*. Firstly, they were evaluated using BLEU metrics system by which *DeepL* system was rated the lowest score of 27.64, while *Google translate* the highest score of 39.12, which in fact is surprising as nowadays *DeepL* is rated to be one of the most popular systems to use for translating. The authors have also included another evaluation, which was conducted by using MQM metrics system by including TAUS error typology. Differentiating from BLEU, MQM metrics system use human assisted evaluation methodology and contrastingly to BLEU (the higher the score – lower quality). MQM metrics showed completely opposite results with *DeepL* having the lowest score and proving to have better output of MT than the competition, with its score being 139 compared to *Tilde* score 188 and *Google Translate* with the highest score of 262 (Povilaitienė, & Kasperė, 2022). Such scores show differences between evaluation proving that one metrics cannot prove the efficiency of a software, in this case of MT systems. To sum up, this study displays comprehensive analysis of both the voice of the users of MT practices and evaluation of MT output by approved metrics and nuances that they display.

Author Levanaitė has also developed similar research to the one discussed previously. She has conveyed a study based primarily on a survey, which goal was to analyse the attitude of Lithuanian translators towards MT and post-editing.

Two different surveys were created for this study to be answered. The respondents were translators (61 anonymous participant) and LSPs (42 translation agencies). Each survey was made of thirteen different questions. First four questions were focused on basic information, for LSPs it was about they job role and for the translators to know about their age group, experience. The rest of the questions were focused depending to whose answering. For LSP it was to gain knowledge if they use MT and their view of post-editing practices. When talking about translators, they had to answer about the qualities of a post-editors, competencies and challenges they face when post-editing MT content. Skipping the results of answers to general questions, LSPs were asked to indicate what challenges post-editing brings out when post-editing to Lithuanian and they had 4 answers to choose from: insufficient post-editing competences, low experience in post-editing field, opinion differences in terms of post-editing and MT quality inadequacy. Most of the respondents (35-36) chose to say that all these given answers have an impact and influence post-editing by given factors and does not display any answer, which would be considered the most notable one. Comparing it to answers provided by translators, most of them (57) noted that the MT output is not sufficient and its difficulties when translating to Lithuanian, while 42 of the respondents said that there is lack of post-editing experience and 43 respondents assures that the attitudes towards machine translation are unfavourable. In terms of competences, 34 translators say that there is not enough of them, while 27 believe otherwise.

Continuing the analysis, the author has also discovered that is no dominating view towards machine translation and post-editing work in the translator ranks, as 29.51 % says that they support the use of MT and doing post-editing work, while 21.31 % says differently. The rest 37.7 % have a neutral view towards the mentioned, while 3.28 % do not have their opinion stated on the matter. The question at hand shows a higher score of the neutral view and it may be because MT output can be evaluated differently each time, meaning that it can be good or it can be bad, thus influencing the post-editing workflow and making it harder of easier when working (Levanaitė, 2021). To conclude this analysis, it can be said that the attitude of LSPs and translators are different regarding the post-editing field. While LSPs identify various challenges when using MT post-editing practices, majority of translators indicate one exceptional challenge, which is that MT quality is poor. To conclude, it must be noted that MT quality differentiates each time when post-editing and attitudes may vary as there is a lot of MT systems and each of them have their benefits and disadvantages.

Summarising this section, numeral problems influence the growth of a language for low-resource languages, including lack of internet presence as dominating languages have their advantage on the internet, standardization of writing systems, insufficiency of electronical resources such as corpora, and a lack of language-specific linguistic view. These challenges highlight the importance of what is needed to boost low-resourced languages and make them relevant in perspective of dominant languages. The outlined studies primarily focus on surveys targeted at field related respondents seeking to evaluate the state of post-editing in Lithuania, taking into account the usage of MT and evaluation of its output and factors that benefit or provide disadvantages for post-editing practices. On the other hand, more targeted research needs to be done towards post-editing Lithuanian MT output, evaluating time, quality, and effort regarding such tasks.

1.1.2. Post-editing guidelines

The guidelines used to evaluate the quality of machine-translated text and determine the level of editing required to achieve the desired level of quality are known as post-editing criteria (or methods). Post-editors, who are human editors tasked with reviewing and improving machine-translated output, use these methods.

One of the methods used in research is TAUS post-editing, a method of post-editing machine-translated text, which was created by TAUS, a language data and technology services provider. The TAUS post-editing method is designed to be a faster, more efficient method of post-editing that requires less effort and produces higher quality output than traditional post-editing methods.

The TAUS post-editing method involves a three-step process:

1. pre-editing**.** Before machine translation process, the source text is pre-edited, to remove any inconsistencies, ambiguities, to correct sentence structure and clarify meaning. Pre-editing aims to enhance the output quality of machine translation and minimise the quantity of post-editing necessary.

2. light post-editing. After the text is processed by machine translation system, the text is lightly edited by a post-editor, fixing grammatical and stylistic issues while preserving the meaning and intent of the original text. Light post-editing procedure is to ensure quality with the least amount of time and work.

3. validation. The third and final stage of the TAUS post-editing procedure involves verifying the output's quality, either by manual assessment or automated metrics.

Instead of aiming for a flawless translation, the TAUS method post-editing procedure is based on the idea of obtaining the required level of translation quality that is sufficient for the intended purpose of the text. By using such idea, machine translation will be more useful and cost-effective for a wider range of sectors and cases with minimal requirements of post-editing.

TAUS has also created a set of guidelines:

- translation accuracy: this category assesses the degree to which the translation accurately expresses the meaning of the source material. This factor considers completeness, accuracy, and consistency.

- language quality: this category measures the degree to which the translation is fluent and natural sounding. Factors to consider include grammar, syntax, and vocabulary.

- style and tone: this category measures the degree to which the translation matches the intended style and tone of the source text. Factors to consider include formality, register, and cultural appropriateness.

- terminology: the translation's proficiency in using the appropriate technical language and terminologies is evaluated in this category. Consistency, accuracy, and appropriateness are factors that should be considered.

- formatting and presentation: this area assesses how closely the translation resembles the formatting and layout of the original material. Headings, lists, tables, and other formatting components are things to think about.

- cultural adaptation: this category measures the degree to which the translation considers cultural differences and nuances in language use. Factors to consider include idioms, metaphors, and other cultural references.

These recommendations show how to ensure quality translation by adhering to the six primary post-editing method factors (Massardo et al., 2016).

The TAUS rules are designed to be adaptable to various use cases and business sectors. In addition, they are made to be used in conjunction with other quality assurance methods and metrics, including automated quality metrics and human review (TAUS, 2018).

To continue post-editing guidelines, a worthy mention should be brought up to the International Organization for Standardization (ISO). ISO has created requirements for the process of full, human post-editing of machine translation output and post-editors' competences, standard No. 18587:2017 (ISO, 2017). Their internation standard is written in detail considering both light and full post-editing.

Firstly, the definition of post-editing, as stated in the ISO standard, is as follows: “To edit and correct machine translation output” (ISO, 2017). When talking about light post-editing it says that it is used to obtain a merely comprehensible text, but it is noticeably not comparable to the product, which is made by a human. It a text with a much less editing done and more MT output left.

This light post-editing method is used, as according to the standard, is when the text is not intended for publication, and is used to get the main idea or point of a text. Post-editors have few main things they need to be attentive about: ensuring that no information or text would be added or omitted; no inappropriate content in the text; and restructuring sentences if they are incorrect or meaningless. As it was mentioned, there should be as much of raw MT text as possible, as it is considered light post-editing and does not include numerous factors that full post-editing would include (ISO, 2017).

In that regard, full post-editing, as stated in the standard, is much broader and more detailed. The aim of it is that the edited text would be comparable to the one translated by a human translator. In this case, post-editors shall, as light post-editors, ensure that no text is omitted, inappropriate text should be edited and sentences with unclear meaning should be reconstructed. In addition, they should produce correct target language text in means of grammar, syntax, and semantics. This means that every sentence should be looked through to make sure that there are no wrong sentences. Next, post-editor should adhere to client and/or domain provided terminology. This rule applies also to the translator, as clients wishes would need to be respected to achieve maximum quality. As per standard, rules of spelling, punctuation and hyphenation should be applied. Post-editor must apply every bit of knowledge to make sure that the text does not have any spelling or punctation mistakes and apply correct hyphens. Furthermore, appropriate style and application of provided (if provided) guidelines is needed. As it was said, adherence to clients wishes is necessary and every translator and (or) post-editor must use provided guidelines. Adapting the correct text by understanding the text is also crucial as incorrect style may lead to misunderstanding of what is being said in the text (ISO, 2017). This standard in detail explains the guidelines of light and full post-editing. It provides diligence and various other aspects.

TAUS and ISO are one of the most known and applied post-editing guidelines, but it is worth comparing them. To provide a beginning to comparison, it is worth discussing scope and purpose of these guidelines.

Starting with TAUS guidelines, these presented methods focus on providing practical advice and practices of post-editing to the user in greater detail than ISO standard. With its aim to improve efficiency of post-editing workflow and to produce better output of the content it presents a highly thought out set of materials that prove valuable to the end user. On the other hand, ISO guidelines are stricter and more focused by displaying general and accurate information related to the field aiming for the same goals as TAUS guidelines. Moving on towards development process, ISO standards have an advantage point as they are developed through a rigorous process by involving input from experts, industry and national standardisation bodies, which contributes to a highly weighed and planned preparation and execution of such guidelines becoming standardised, while TAUS guidelines are developed by industry professionals and experts of MT and post-editing, thus providing a lesser spectrum of individuals participating in creation of such guidelines. Content wise, TAUS guidelines are of broader spectrum, featuring practical recommendations and practices for post-editors concerning linguistic and stylistic features, with optimization of workflow advice. On the contrary, ISO guidelines specify requirements for such processes, with competency requirements, documentation, and quality assurance.

Going over to applicability, ISO guidelines are recognized internationally and may be thought of as the best guidelines for post-editors, as it can be used for certification or compliance, together with contractual obligations, while TAUS guidelines do not have such recognition and may be less known than the standard but are still widely used and recognized in translation industry. Last criteria that need discussion is updating of the mention guidelines. While TAUS is not regulated by international company, it may be updated more frequently in terms of newly used practices and technologies in the field, which could essentially provide new methods and perspectives to the post-editor, then again ISO standards have a periodic review procedure, which involves updating processes to reflect today's market and practical, seeking to ensure relevancy and to be up-to-date with the industry.

Such comparison shows that both set of guidelines have the same goal to improve the quality of post-editing field, but also are different in several factors like updating and development process. Regarding usage, both are widely used and known.

Several authors have created a spreadsheet for guideline creation. Angelone, E., Ehrensberger-Dow, M., & Massey, G. (2019) in their research have drawn up several criterions of what the guidelines should consist of, and they also included customer's view:

- according to the guideline creation criteria's that authors have wrote about, the MT system used should be indicated in the guidelines. As it is known, there is a lot of different MT systems available for free public use, but some are better than others. As this is said, it is known that some systems use the data inputted into and stores it in its database. This can raise some issues for the client and LSP as fear of a data leak is a real concern.

- secondly, the guidelines should have a description of source text, type, and structure. Knowing the source text is crucial quality of the translation. It may require deeper understanding what type the text is and what it will be used for as every text is translated differently and needs to be edited accordingly.

- evaluation scores are also crucial when dealing with MT and these criteria suggest that they should be added with the work, automatic or human evaluated. These scores, like example in SDL Trados, quality evaluations are presented by % (precent), which indicates the quality of that segment, thus indicating where post-editor needs to be more attentive and where no or light post-editing is needed.

- these evaluation scores pose a problem that authors explain as disregarding the segment. If the sentence evaluation is very low and the sentence is big, what one should do, should the segment be disregarded, and the post-editor should ignore it, or he should do full post-editing of such segment.

- it is also crucial that types of errors for fixing are indicated in the guidelines. If this would be included in the guidelines, post-editor could have better view of what needs to be done and what can be left unedited, thus increasing the speed of one's job.

- stylistic changes, what needs to be corrected and what should not be changed, needs to be included. A lot of big companies, like *Netflix*, have their own style guides for a translator or post-editor to review before starting the work. These style guides explain how to translate correctly to keep the consistency of translation as similar as it can be.

- the crucial factor to be included in the guidelines is terminology, what to do with it. MT systems have their own terminology banks, while the customer could have other terms that needs to be included in the translation. What MT provides may not be as accurate as the customer wants or far away from it, thus the factor of what to do with terminology needs to be added into the guidelines.

This spreadsheet provides a brief explanation what every post-editing guideline set should consist of. Recommendations and distinct factors presented are crucial to post-editing work and quality assurance. Moreover, by following the guidelines consistency can be achieved through out various translation and post-editing tasks (Angelone et al. 2019).

When examining this period, in 21st century, automatization of processes is becoming increasingly common. Post-editing is not an exception. Automatic post-editing (APE) is a system that corrects errors in MT output. As a system it also needs to be trained to achieve high-end human-like results. APE is particularly new field of research, but it is being researched more and more. Systems are created to show the errors found in sentences, suggest correction variants. The systems are based on datasets of post-edited content that is analysed in the system, which means that if the dataset is big, the more likely it is to edit a sentence correctly (do Carmo et al. 2021), expressing a disadvantage of low-resource languages having less developed datasets to complete such task and provide quality output.

1.2. Importance of online news and their translation

This section of the study involves an overview of why online news worth are discussing and why translation of online news is important, featuring the outline of MT contributions towards this field.

Online news, or in general terms, journalism field is one of the most visually perceived results of digitalisation (Fuerst et al., 2015) as people are moved and are still transitioning from long-standing news papers to reading the news online via online media channels like *BBC* or *CNN* (Lithuanian equivalents would be *delfi.lt* or *15min.lt*). This transition influenced not only the readers of news but also the industry as a lot of different news organisations had to transition from classics to digital media. These media industries have to keep up with the demand and provide news of a wide scope (for example, events, sources, breaking news etc.) everyday.

1.2.1. Significance of online news in digital world

Shifting to relevancy of this field, it is important to note that the provision of news has its value around the globe and is important in many different aspects. The beginning of this field has started with the introduction of computers and internet, which provided a platform to spread the news to people around the world. Certainly, this platform can be interpreted in different ways, as provision of news can lead to spreading corruption, propaganda and other variations that can affect life of a reader (this is applied for known cases in Afghanistan, New Cuba, and other countries) (Harbron, 1995).

Knowing these factors, non-profit organisation called *Reporters Without Borders* (RWB or *Reporters sans frontières*, RSF). Officially, this organisation is said to be serving public interest (Chattopadhyay, 2008), meaning that their work is done to show the truth of a certain situation, but have also attracted a lot of attention to themselves. Even though this organization is non-profit and non-governmental, such organizations like UNESCO or United Nations (UN) have done research based on them, featuring themes like safety and actions in high-risk environments (Frutos, & Giannone, 2018). These reporters venture through dangerous environments seeking truth and sharing the acquired information with the rest of the world on their own free will. Numerous occasions have risen where such reporters have disappeared or mysteriously died. It is believed that such occasions are connected to silencing (seeking that no information would leave a country). Most research done by RWB are mostly in high-risk environments or in other words, countries that are considered dangerous or accused of high media censorship.

For instance, RWB has done research concerning Uzbekistan. Their research consisted of reporter, who analysed and confirmed that media censorship was being strengthened in terms of what can be said on the internet grounds. Not long after the reporter who announced this, was silenced by Uzbekistan government (Kendzior, 2010). Such act can be considered act of violence against reporters and communities as the truth cannot be spread and must be silenced at all costs, meaning correct words have to be chosen for no consequences to appear.

It is noteworthy to mention that online media is a growing part of digital word. The truth is to be expected from such field and to know and understand what is happening across the globe, which makes this field more important than ever.

1.2.2. Translation of online news

As this field is transitioning from paper to digital era, it is important to discuss how news from one country are received by another country. Primarily, these news translation studies are deeply rooted with globalization (Bielsa & Bassnett, 2008). This connection became greatly visible in 21st, with digitalisation showing its correlation between these two fields. Authors Bielsa and Bassnett (2008) call new news agencies by title of "translation agencies" with great amounts of information in translation, which makes the role of translation very important.

The question is whether translators could become journalists and play their part in presentation of news for the big agencies, the noted authors discuss such question with irony "even if they are not journalists, news translators must work as if they were" (Bielsa & Bassnett, 2008). This expression explains that news translators must have distinctive competencies that would allow them to work in such field and present translations as they were wrote by a competent journalist. As this article was written in 2008 and a lot has changed it is worth overviewing more recent research.

One of the authors of the mentioned research, Esperanza Bielsa (2016), wrote an article titled "*News translation: global or cosmopolitan connections*". In this article the author analyses the changing context in news and translation fields noting that translation process is still invisible in preparation of news. Comparing this article to the previous one, author suggest that globalization theory, even though it is still connected, is being changed to new cosmopolitanism, which is understood as people being citizens of the world, rather citizens of a particular state or country (Britannica.com, 2024). This theory of cosmopolitanism in news posts translation in a new spot, enabling translations to be visible in such line of work and considering it as a doorway to understanding cultures and matters with the help of translations (Bielsa, 2016). This results to an even closer connection in comparison to globalization, as cosmopolitanism differs cultures, their understanding rather than showing one global culture for people. Author also compares news translation recognition in 2006 and 2016. When compared, author distinguishes that in 2006, such research was optimally rare and was not considered for research, and in 2016 she notes that such field has been recognized by evident research being made across the globe. It is understandable that this news translation field would become recognized and researched as an impact of digitalization, which is closely related to both fields, news, and translation.

Moving on to 2024, this research is still being done, which can be seen by amount of research published in open-sourced systems like *Google Scholar*. Authors of an article titled "*News Translation and News Translators"* (2024), have decided to conduct on analysis analysing the competences and knowledge needed to translate and understand translation of news. Their analysis was based on a survey of 12 field experts, like journalist-translator, news translation instructor, translator-editor etc. They were asked to answer four questions: what the process of translating news is, what kind of role do news translators play in production of news, what competences should news translator have and do universities prepare for such tasks (Dorrimanesh et al. 2024). From the research it can be understood that the answer to the first question is that the process involves a close communication between translator and the news agency. The translator has its own free will to choose their area of interest and choose articles to translate.

Such free will is based on competencies and experience in translation as one can be sufficient in translating legal or political texts but not medical field texts. It is also brought up that a big part of the translation and what to translate is based on agency one translator might work in, as every agency might have different rules and workflow regulations. Based on what was presented, it is notable that if translator has an opportunity to choose the news, he wants to translate he could also be called journalist as he presents the news by translating them. Another question that needs discussion is translators' part in production. Analysing the research, it can be said that ten of respondents stated that they also edit the news.

This response means that translators can also edit the news to make them more presentable and interesting to read. By doing so, translators grant themselves a confirmation that what they translated have a higher chance to be published and presented to the readers. This additional task provides another insight at a news translator and the needed competences for his work, and it is clearly visible that only translating will not be sufficient to work in such field.

In today's era of information overload, machine translation being highly developed with NMT and artificial intelligence AI models, and post-editing practices, it is noteworthy to emphasize MTPE in translation of news. Martín Ruano (2021) calls such phenomena a "mechanistic" translation model. In his research, the author analysis the usage of machine translation systems in translation of news with additional view to post-editing such production. From other authors, that were analysed above, it was found that news translator must have a lot of different competencies and experiences to work in such a field, that would result in output of understandable and easy to read quality, rising interest to the reader to continue reading such news. Martin Ruano has analysed different articles that raised suspicion that news could have been translated using MT. His analysis included original source text in English, target text in Spanish, the same source text translated by machine translation system *DeepL* and *Google translate* and the published text in news portal. The published text contained similarities to both MT systems, which indicates possible usage of MT to translate the text, not to mention unusual text spots that does not sound natural. His analysis shows correlation to concept of textual fit, which is described as "the linguistic distance between translations and non translations of a comparable genre" (Łucja, 2014). This concept suggest that the readers are evaluating text based on previously read texts, by which if previously read text was prepared by human and other text is prepared by MT and not edited closely, reader may have discomfort and dislike of such articles. That is why MT post-editing practices should be applied to such translations and productions as the quality of MT is still debatable and may seem unnatural or not so easy to understand, especially if the text contains stylistic or syntactic errors.

It is important to outline what strategies and methods are used to translate news texts. Peter Newmark (2001) has created his own news translation theories for long sentences of news. The deeper meaning of his theories is connecting translator with the text, creating a strong and faithful connection between them. Firstly, one of his theories is called "semantic translation theory". This theory suggests that translator should "be faithful to the original text and attach importance to the emotion and personality embodied in the original text" (Newmark, 2001), meaning that the translator should convey the main ideas of the author including emotion and personality factors. Emotion factor should resemble what emotions does the story convey (happy, sad, neutral, etc.) and must be translated in such a way that would clearly show such feelings, whilst re-capturing the deeper meaning of the story, not removing the personality qualities from the text that they author tries to convey.

His other theory, communicative translation theory contradicts the first one. This theory suggest that the translator should be reader-centred, keeping his engagement through out all of the story. Such translation enables the translator to be creative and focus not only on the meaning but also on expression of the story, keeping it interesting. Applying such theories improves the overall quality of translation and the translator becomes the re-creator of the story (Zhang, 2008). These theories represent complexity of news transmission by translation, proving that the translator of such texts needs to have various competences and skills for such tasks.

Authors Luan Lijun and Guo Yingping (2020), who analysed Peter Newmark theories, have distinguished four translation strategies for long sentences when translating from English to Chinese: sequential translation, splitting translation, reversing translation, and recasting translation (Luan & Guo, 2020). Sequential translation is literal translation in terms of the word order, meaning that when such strategy is applied, the sentence needs to follow original text word order. Such strategy is used when the facts, like actions done, are written in logical time order. Revising translation is used when the original source sentence is long and complex. Then the sentence is translated from the end to beginning, changing the word order completely. Splitting translation strategy is basically splitting the sentence into two or more (depending on the length of the sentence and what is being said). Translating in such a way simplifies the sentence and makes it easier to understand. Recasting translation strategy in other words could be called recreation on the source text, by completely remaking a complex sentence by logical or time factors. This strategy involves different strategies combining like revising translation strategy + splitting translation strategy to create quality output that is easy to understand and to read (Luan & Guo, 2020). It is important to note that Newmark theories are also brought into these strategies, with a goal for excellent quality of the translation and understanding factors.

To recap the theoretical literature overview, machine translation has brought many beneficial factors into translation field, creating post-editing tasks, and decreasing the effort that translator has to put into his work. Talking about post-editing, such tasks are understood in a simple manner of editing machine translation output to make it good quality wise. To complete such a task different guidelines and rules like TAUS or ISO standard needs to be applied, that specify what needs to be considered and edited, dependently on how much of editing is required for the text (full post-editing or light post-editing). Understandably, such field still requires research as MT progresses and improves along the way. Comparing what is done, it is seen that dominant languages in this field has a lot more research done and can justify the relevance of this topic in certain language combination, but keeping in mind that low-resourced languages like Lithuanian have extensive research and studies made that are worth reading. Considering MT and this digital age, it is also important to note the relevancy of online news and media being found on the internet, overviewing how they are translated, how MT is beneficial to such field and what strategies can be used when working with such translation or post-editing tasks. Circling back to Lithuanian language, research still needs to be made in the post-editing field taking into account the progress of MT as low-resource languages has their issues having small datasets and corpora’s.

2. The results of machine translation and post-editing analysis via survey and MTPE task

This section presents methodology used in order to conduct a study regarding MT and MTPE. Used methods are applied towards a survey and preparation for an MTPE task. The results of research done are presented below and categorized into two sections (see section 2.2 and 2.3). After the analysis of results, conclusion statement is presented overviewing all of the findings and concluding the study.

2.1. Methodology and research findings

This section outlines methodology applied for this research, detailing procedures, and methods for the conduction of analysis. For this thesis on post-editing issues of online news a mixed-method approach is used considering both quantitative and qualitative methods for a broad analysis of the topic. Additionally, comparative analysis is used in second part of the analysis.

The first part of the analysis involves quantitative research in a means of a survey based on Povilaitienė, M. and Kasperė (2022), R. research concerning neural machine translation and post-editing practices in Lithuania. Their survey part of the research considered some important questions about post-editing field and usage, which is why it suits this analysis. The survey is based online, prepared on *Google Forms* platform as it is easy to understand and use. Survey was opened from 19/04/2024 to 27/04/2024, 9 days for respondents to fill in the survey. It was shared through two social media platforms *Facebook* and *Linkedin*. Several Lithuanian translation agencies were asked to send the survey to their EN-LT language combination translators for their opinion. Target audience for this survey is freelance translators/post-editors and LSPs (seeking broader range statistical analysis of respondents). The selected target audience is chosen because of their relation to the field and work. Translators/post-editor's having to match the criteria of experience (no less than one year) in the field, this also applies to LSPs. Data collection process will ensure confidentiality and anonymity by means of no private questions involved, for example, they will not be asked to fill in their name, age, birth year etc. Such survey will provide a new analysis of MT and post-editing field, including translation and post-editing of news texts, keeping in mind the progress of machine translation systems and their quality.

Considering the questions, majority of the questions will be based on choosing the most appropriate answer. Some questions will provide an ability to write their own thoughts. Firstly, two general questions will be presented to familiarize with the respondent:

- *Profession* (translator/post-editor; editor; LSP).
- *Experience* (less than 3 years; more than 3 years).

Questions for analysis are:

- *How often do you use machine translation when working?* (always; often; sometimes; rarely; never).
- *What MT systems do you use?* (*DeepL*; *Tilde*; *Google translate*; *eTranslate*; other).
- *How would you evaluate the output of machine translation systems?* (excellent; good; adequate; bad; variable by text).
- *In your opinion, what kind of errors does MT provide more frequently?* (grammatical; context related; syntax; meaning; spelling and punctuation; other).

- *How often do you do machine translation post-editing related tasks?* (every day; once in a few days; few times a week; once a month; never).
- *Why do you do machine translation post-editing?* (upon request from LSP or client; on my own initiative; other).
- *Is machine translation post-editing easier than translating without MT?* (yes; no; about the same effort).
- *Does machine translation output require post-editing?* (yes, every time; sometimes; no; depended on what MT system is used).
- *Could you indicate why machine translation post-editing is better than translating without MT? (Multiple choice)* (it provides an outline of a sentence with main idea and structure of the sentence already translated; machine translation systems provide better results than translating without MT; post-editing of MT requires less effort; MTPE is faster than translating without MT).
- *Can you list any drawbacks of MTPE?* (poor quality of MT; requires more effort; lower rates; data security issues; inconsistency issues; loss of translators input in the work; lack of competencies).
- *Is machine translation systems trained enough to make post-editing Lithuanian language worth it?* (yes; yes, but it still needs more training; no, MT is not trained enough, No, post-editing Lithuanian MT output requires a lot of effort).
- *Keeping in mind previous questions, is MT developed enough to provide a worth-editing output in Lithuanian when working with news texts?* (Yes; Yes, but the output needs to be fully post-edited; No because news texts are complex to translate; No, because news field needs various competences).

The provided questions will overview frequency and usage of MT, evaluation of its output and distinguish errors. Furthermore, answers will provide ability to discuss about frequency of MTPE tasks, reasons using its practices, comparison with translating without MT, necessity and advantages and drawbacks of MTPE.

The second stage of this study is to analyse a light post-editing task done by Lithuanian translators. This analysis is partly based on Vilém Zouhar et al. (2021) research on time evaluation of human translators, additionally including evaluation of quality and changes made during post-editing process. To achieve such goal, software *Translog* created by *Center for Research and Innovation in Translation and Translation Technology* is used. *Translog* is a program to record and analyse human reading and writing processes. It provides grounds to track time of a translator post-editing the text, analyse what changes has been made and to evaluate the quality of the translated text after post-editing. Moving over to the text, a paragraph of English news text is taken from *BBC.com*, one of the biggest news publishers. The paragraph consists of 618 words. The theme of the paragraph is commencement and early proceedings of Donald Trump's first criminal trial. Such text is uploaded to *Translog* with its translation to Lithuanian using *DeepL* machine translation software, which is chosen because of its popularity, research, and quality factors. Text is visible in appendix 2 (see. appendix 2) with its translation by *DeepL* and applied segmentation (25 segments). After that the text is ready to post-edit. 6 translators were chosen to post-edit the said text.

Translators were chosen in random manner, but with criteria to have at least 2 years of translation and/or editing experience. Their identity is left confidential and henceforward will be called translator 1, translator 2 etc. Training with *Translog* software and ISO standard light post-editing guidelines were provided to each translator. Considerable factors are displayed in table below, which was created adhering to ISO standard and its material (see table 1).

Table 1. ISO standard light post-editing guidelines

ISO standard light post-editing guidelines
Light post-editing guidelines to follow when post-editing: • to use as much MT as possible; • to ensure that no additional or omitted information is presented; • to edit any inappropriate content; • to reconstruct sentences that have unclear or incorrect meaning. (ISO, 2017)

Time limit was 1 hour 30 minutes (this time includes a short break). After the completion of the task, *Translog* log file was collected and mentioned factors were analysed by using software provided statistics and overviewing of segments post-edited. Additionally, some of the translators were asked to provide comments about such task and their view.

2.2. Survey analysis

This section provides an overview of survey analysis results. All questions are detailed and analysed in sequential order with figures presented to some of them.

General questions.

Qs. 1 & 2. What is your profession and *how much experience do you have in the field*?

To start this analysis, the overall number of respondents that filled the survey is 116. Through out the process of sharing the survey, several comments and opinions were expressed in the *Facebook* post. Moving forward to the analysis of the questions, first questions were general type questions seeking to find out what kind of profession the respondents work in and how much experience they have in their field. Starting with profession, 81.9 % (95) of respondents have said that they are working as translators, keeping in mind that they also complete post-editing and editing tasks. 7.8 % (9) of respondents distinguished themselves as project managers, as several LSPs were asked for they input into the analysis. 4.3 % (5) said that they are editors and the rest 6 % (7) is information provided by 7 respondents (otherwise known as answer option: *Other*, which is free to fill) about their professional. 3 respondents said that they work as translator, editor, and post-editor at the same time, one distinguished that she worked as project manager, but now she is translator, editor, and a lecturer. Last one said that he or she is a translation field student, who also works as a translator. No one has selected option *post-editor*, which means that no one distinguishes themselves as post-editors, majority selected that they are translators, but proceeded to fill in the survey, proving that translators do post-editing tasks.

Talking about the experience, two answers were to select: *less than two years* and *more than two years*. 86.2 % (100) selected the second option, proving that they have over two years of experience in translation field, while the rest 13.8 % (16) selected that they have less than two years of experience. The answers show that majority of the respondents have more than two years of experience in the field and have worked with various tasks related to translation and (or) MTPE.

Questions for in-depth analysis.

Q. 3. How often do you use machine translation when working?

These questions, that are designed for in-depth analysis, start with the first four being related to machine translation systems and their quality with a goal to analyse various factors of MT. Respondents were asked to provide insight about their usage of MT systems frequency. Majority of the respondents (51) said that they use MT systems often, while 31 indicated that they sometimes do use MT systems to help them with their work. Two selection options (*rarely* and *always*) were selected equally, 15 responds to each option. Lastly, 4 respondents chose to say that they never use machine translation systems when working. First four options provide insight proving that MT is in fact used when working, while the last one provides that there are translators that do not use machine translation for completion of their tasks.

Q. 4. What kind of MT systems do you use?

Such question was given to see what kind of MT systems are used the most among the respondents. The options were: *DeepL*, *eTranslate*, *Google translate*, and *Tilde*. This question was a *multiple-choice* question and also had option *Other* for respondents to fill in if they use other types of MT systems. From the collected data it is visible that *DeepL* is by far the most used machine translation system among the respondents with 89 respondents choosing *DeepL*. Given its ratings and research done concerning this system, it can be said that *DeepL* ranks are still higher than other systems. Second place is dedicated to *Google translate* with 55 respondents, which does not come as a surprise as *Google* is one of the most known internet engines in the world having its own translation system. 16 respondents marked *Tilde* as their translation system, while 6 others chose *eTranslate*. These systems are not as well known as first two and not as researched as them so its natural that their usage is not as frequent. 18 respondents chose to provide their information it the *Other* field. Their answers include such systems as *Phrase* (4 respondents), *Microsoft translator* (1), *Redokun* (1) etc.

One noticeable answer that was filled in was related to the client, which says that the respondent uses the system only for his or her own needs, because the contract with his or her LSP states that if the text is uploaded into MT system not provided by the LSP, penalties may apply. Such answer provides indication about MT systems and their data security, which could be considered as lack of trust towards MT systems.

Q. 5. How would you evaluate the output of machine translation systems?

It is important to distinguish the quality of MT systems and that is why such question is provided. The quality of MT systems is very debatable and discussed, providing that it is still a relevant and everchanging object. This question consists of 5 different answer options: *excellent*, *good*, *adequate*, *bad*, and *depending on the text*. As MT is everchanging and its quality is different each time, the most responses were assigned to answer *depending on the text* with 46.6 % (54) answers.

The given result provides validation to previously stated fact about its quality being different each time, and each different text or sentence inputted into MT varies in terms of quality. *Good* and *adequate* answers have the same number of responses: 25 (21.6 %) responds to each selection, while only 6 % (7) participants said that the quality of MT is perfect.

Last 4.3 % (5) respondents chose to say that quality is bad. From the results it is visible that the quality varies each time in relation to the type of text that is being translated and given the fact that each translator is different and views are different, it could be said that some of them may value MT in terms of post-editing effort and how much of it is needed to make the text good in quality, thus their answers may vary depended on that.

Q. 6. In your opinion, what kind of errors does MT provide more frequently? (multiple choice)

Following the last question, this question is designed to see, what kinds of errors does the respondents face most frequently, thus such question will provide insight into what needs to be updated and improved in MT systems.

The question had 5 answers to choose from: *grammatical*, *context related*, *syntax*, *meaning*, *spelling and punctuation*. In addition, *other* was provided for their input. The results are visible in figure 1 (see. fig. 1).

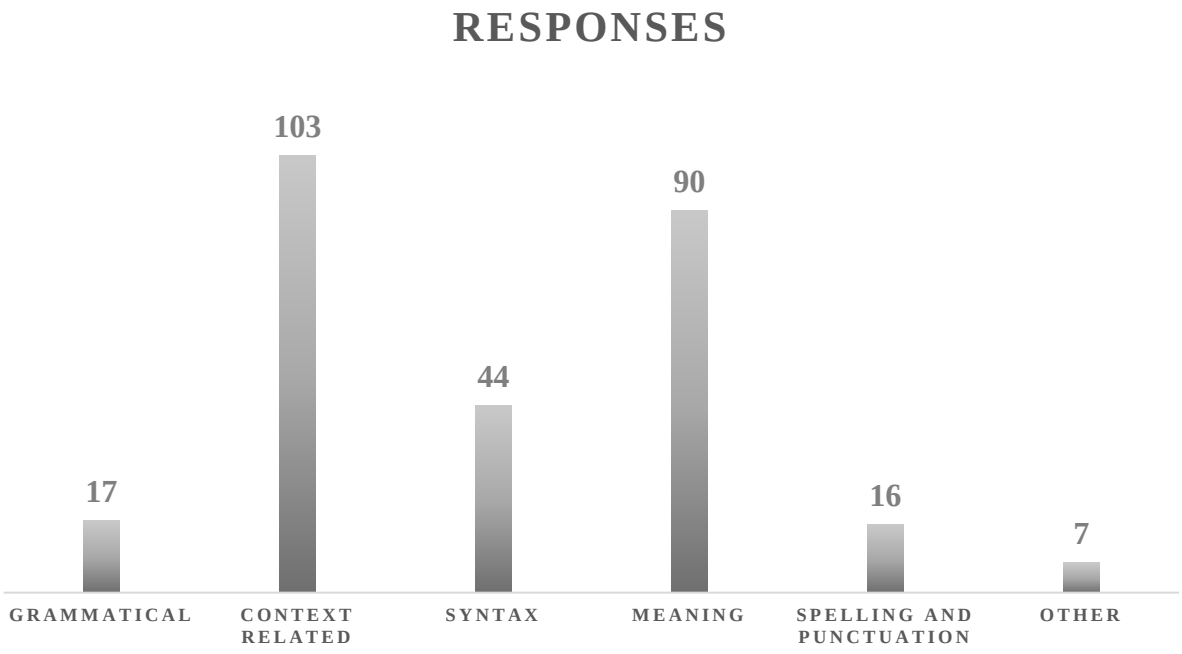

Fig. 1. Results of question 6

From the diagram it is visible that context related issues of MT systems are the most common between the respondents (103). Such issue can be considered persistent between the texts as MT systems lack the comprehension to understand contextual information although research made with NMT+AI shows improvement. Such an issue also raises questions of its own, for instance, does MT understand context when a paragraph of text is inputted, does it comprehend what type of text it is, because it is natural that MT systems cannot understand the context if inputted text is a single sentence without any before or any given sentences.

Second in place that respondents find the most is meaning errors in the received output (90). Meaning errors include various aspects to consideration. For example, ambiguity could be considered as a meaning error, as words that two or more meanings may have influence towards the MT output, as the system may have difficulties trying to understand context and choose the one that does not suit the ST. According to the results, syntax errors got 44 responds. Syntax errors could result in wrong word order in the sentence, mismatch in between grammatical errors, missing or added words etc. Such errors could influence the readability of the text, creating discomfort when reading, thus having a need to be fixed and corrected to make the text fluent and easy to understand. Grammatical errors have received only 17 responds, which shows that respondents see less mistakes related to grammar, thus less editing is needed. Following grammatical errors, spelling and punctuation errors account for 16 responds, proving that such issues persist when working with MT. Lastly, section *Other* has received 7 responses from the survey participants. 5 of the responses figures around terminology issues when working with MT. Such issues relate to MT incapability to understand acronyms (leaving them as it is or wrongly translating them), term inconsistencies, making the translator review every term to see if the terminology is consistent. Terminological consistency and correctly chosen terms lead towards better quality of the output, but if not reviewed and fixed it could cause meaning and inconsistency errors. Overall, this question displays the drawbacks of MT systems that are in a need of reviews and updates, that would enhance the quality of output.

Q. 7. How often do you do machine translation post-editing related tasks?

Moving forward from the questions focusing MT, the rest of the questions consider machine translation post-editing and different aspects in relation to the field. To start this section, question *how often do you do machine translation post-editing related tasks* was provided to the respondents. 5 different answers were provided: *every day*, *once in a few days*, *few times a week*, *once a month*, never. The answers are split almost equally. Firstly, answers *once a month* and *few times a week* got 26.7 % each (62 respondents in total). Answer *every day* was chosen by 22.4 % (26), while 15.5 % (18) said that they do not do post-editing tasks. Lastly, the lowest percentage 8.6 % (10) is assigned to answer *once in a few days*. The result of this question provides information about the frequency of working with post-editing, and it can be said, that the frequency is very diverse. As it can be seen, some translators work with post-editing tasks every day, while others once a month or few times a week. This may be because of the view towards post-editing tasks, because for some translators such tasks can be seen as too difficult or not worth their time. Certainly, there are many reasons why translators would or would not work with post-editing tasks. Such reasons are presented in question 11 and 12.

Q. 8. Why do you do machine translation post-editing?

By asking such question, reasons why translators do post-editing tasks are presented. This question is different from all others because it has the highest count of filled in responses. Answers to choose from were *upon request of client or LSP*, *on my own initiative*, and *other*. The majority of participants (51.7 % - 60 participants) choose to say that they do MT post-editing tasks upon request from client or LSP, while 30.2 % (35) chose answer two (*on my own initiative*). What is interesting, that this question received 14 inputs, which accounts for the rest of the percentage – 18.1 %. It is clear that there is a distinction between given selective answers.

Such distinction could be based on translators working for language service providers that are providing them with post-editing tasks. Another reason for such distinction could be related to usage of MT when working, thus meaning that if the text is received without automatic machine translation input, the translator (on a voluntary basis) uses MT to ease the overall translation process, but these reasons cannot be proven without any evidence of such work process. It is worth overviewing some of the information that respondents filled in. One of the respondents' states that he or she usually does post-editing tasks upon request by client or LSP, but according to the inputted information, he or she says that such translation usually takes more time than translating the text from scratch. This answer is valid because of the fluctuating machine translation quality, as well as what MT system is used, because it is known that ones are better than the others.

Continuing on the information, the respondent says that the he or she does MTPE tasks when working with CAT tools like *Phrase*, when it is instantly seen that the file is MT translated with output already presented in the tool. This also can be validated as some CAT tools (*Phrase*, *SDL Trados* etc.) have their own MT systems that provides already pre-translated text to post-edit. Moving on to other answer, one participant speculates that even though he or she currently declines post-editing tasks, it may be hard to avoid it in the future. Such statement does have a reason to be said, as MT systems are actively progressing, being updated with AI features, which is proven to provide better outcomes. Although, even it does progress, human touch is still considered to be needed to fix any mistakes or to make the text sound less "mechanical" (mechanical, artificial, robotic, made by a system – not by a human).

Q. 9. Is machine translation post-editing easier than translating without MT?

Question 9 was created to see how translators view MTPE tasks and do they find it easier than translating without using machine translation systems. Presented answers are: *yes, no, about the same effort*. The distribution of responses revealed a diverse range of viewpoints among the participants. 42.2 % of respondents selected answer *yes*, saying that MTPE tasks are easier translating without MT, while 30.2 % said that it is not easier. 27.6 % chose the third answer. This diversity between respondents and their chosen answers provides an insight into perception of MTPE tasks. Certainly, each task can be completely different in terms of text theme, MT system used, quantity, effort, time consumed, etc. but all these factors are influenced by MT and its quality. If the machine translation system is good and provides good output in terms of quality, the task itself becomes easier and takes less effort than translating without the usage MT.

Q. 10. Does machine translation output require post-editing?

This question is aimed to examine the view towards MT even more, by analysing respondents view to the quality of machine translation, meaning if the output does not need any post-editing, their view towards MT is positive. Answers to the question were yes, every time, sometimes, no, depended on what MT system is used. With that said, it is made clear that the respondents view towards MT output is negative, and it does need post-editing each time, as 90.5 % (105) of participants responded that MT output needs to be edited every time, while the rest 8.6 % (10) said that not always but sometimes. One person decided to choose the third answer. Almost every participant agrees that MT output needs to be post-edited every time it is used, and previous answers to the questions can support such statement.

Although only one person selected the third answer (depended on what MT system is used), this answer can be understood from two sides, that would affect one's work. Firstly, if a good MT system is used, the effort to post-edit would decrease, saving up time and easing the process of translation for the translator, but if system that is known to provide low quality output is used, the time and effort would increase and create a difficult and long translation/post-editing process.

Q. 11. *Could you indicate why machine translation post-editing is better than translating without MT? (multiple choice)*

By providing such question, visibility of benefits of post-editing are presented, showing what the reasons are for doing MTPE post-editing and why it is easier than translating without using such MT systems. This question is multiple choice and presented answers are as follows: *it outlines translated sentence's main idea and structure*, *MT systems provide better results than translating without MT*, *MTPE requires less effort*, *MTPE is faster than translating without MT*. Responds received are displayed in figure 2 (see fig. 2).

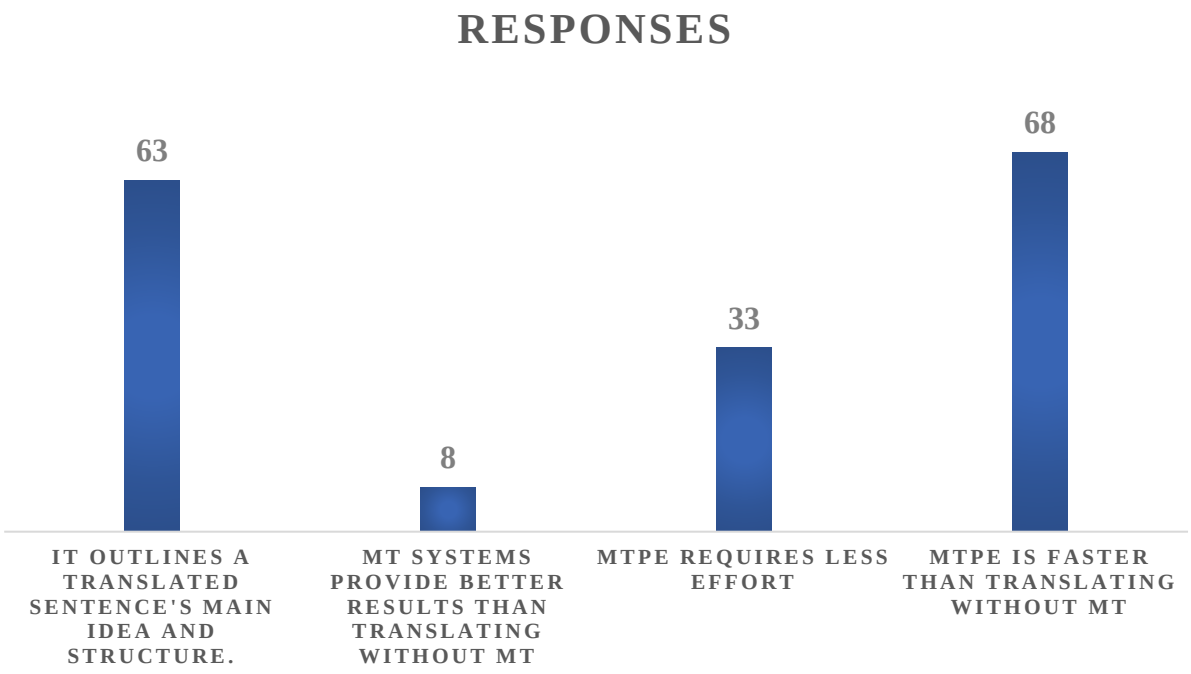

Fig. 2. Responses to question 11

Answers to this question are focused on four main aspects of doing MTPE tasks: time, quality, and effort. As this is said, majority of respondents chose to go with answer 4, which got 58.6 % (68) of all responds. The answer considers translation and task completion time (effort), and by such results it can be said that MTPE is indeed faster than translating without using MT systems, thus speeding up the completion of the given tasks. Secondly, answer 1 received 54.3 % (63) of all responses. This answer also considers time and effort that is needed for the task. Given the number of responses, it can be said that translators value the pre-translated text they receive, because even if it needs post-editing is needed, the main structure and idea is already presented in the text (this is dependable on the MT system, which is used to translate the text), thus saving time and effort seeking to understand the text and how it could be translated.

Answer *MTPE requires less effort* contradicts what was said and what was chosen by the majority of respondents with 28.4 % (33) choosing this answer. Certainly, MTPE is not such an easy task to be done, as every MT system is different and provides different output each time, which varies in quality and, afterwards, the time spent on post-editing, thus proving such question legitimacy as every experience of doing MTPE is different and varies in effort, time, and MT output quality.

Lastly, 6.9 % (8) respondents chose to say that MT systems provide better results than translating without it. As only 8 people chose this answer, in the view of other answers, it can be said that MT systems require post-editing each time and maybe in some cases it provides better output that translating without MT, but as the number of respondents suggest, MT does not provide such quality that it could be said that MT is better than human-processed translation.

Q. 12. Can you list any drawbacks of MTPE? (multiple choice)

Moving on from the benefits, question 12 considers the drawbacks that MTPE has and makes tasks post-editing from EN to LT difficult. This question is also a multiple-choice question and the answers that were presented are: *poor quality of MT*, *requires more effort*, *lower rates*, *data security issues*, *inconsistency issues*, *loss of translators input*. The results of this question are presented in figure 3 below (see fig. 3).

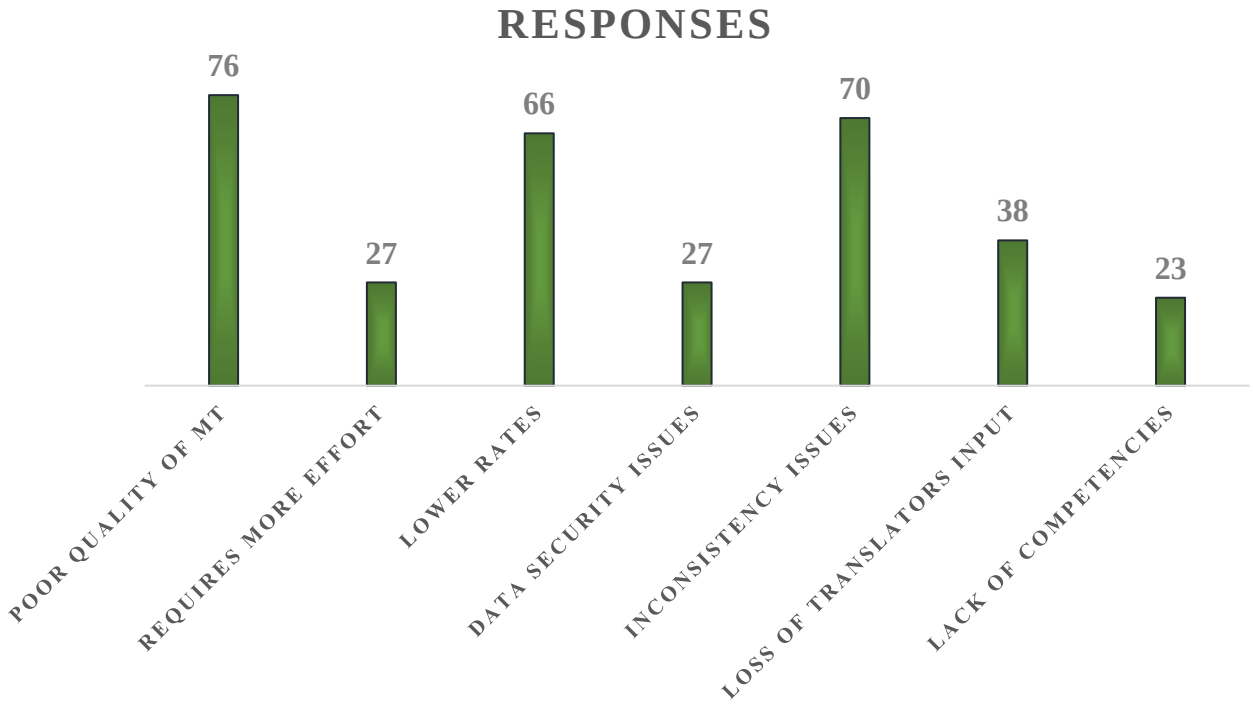

Fig. 3. Results of question 12

As it is presented in the figure, this question is the first question to consider view from market perspective and competencies. As results show, firstly, the biggest drawback among our respondents is poor quality of MT with 76 responds (65.5 %). It is only natural that such issue would be presented as the most relevant one, because it is the most influential factor when doing machine translation post-editing tasks, as poor quality creates the need for input of effort and time for corrections of such output, in some cases, even to retranslate.

Inconsistency issues relate to overall text post-editing and got 70 responds (60.3 %). Such issues refer to quality variations and effort per sentence or segment, thus creating inconsistency in workflow and general post-editing experience. Additionally, inconsistency issues also relate to terminology and the way MT translates the same term, as an example, if the inputted text consists of few hundred words, there may be terminology issues, as MT struggles to create seamless translation in terms of consistency. As it was mentioned, market factor is also considered, and greatly influences the outcome of this question. 66 respondents (56.9 %) think that one of the biggest drawbacks of MTPE is market rates. As it is known, market rates for MTPE tasks are lower than translating without using machine translation systems, as MTPE is an easier task and faster to do, but such problems as poor quality of MT are not considered (depending on the MT system), thus leaving the translator with lots of work but low payout.

Automated systems like MT can bring "mechanical output", which is one of the reasons why 38 (32.8 %) respondents though that loss of translators output is also a drawback. Translations that are done with MT can sound "mechanical", meaning they lack the natural feel or fluidity in the output. Certainly, such issue could be fixed by a translator, but if the task is to post-edit (especially if the task specifies to do light post-editing), the mechanical feel may still be presented. The same number of respondents responded with the same number of responds: 27 responds for answer *requires more effort* and the same number of responds to answer *data security issues*.

As the question of effort has been discussed, data security issues is also a variable in such field. Data security is one of the biggest factors considered in this age of digitalization, same applies to MT post-editing field. Clients, agencies, and translators (of course not every client or agency, or translator) think about data security, that's why some agencies forbid translators to use MT, which if used could be considered as data breach/leak, unless its already done by a program they trust or that have such functionality like *Phrase*. As it was mentioned, another aspect that was not considered before is competencies. The answer result (gaining the lowest number of responds – 23 or 19.8 %) shows that competencies are not a very considerable variable. Because of such low number, it can be said that maybe the competencies are not that much needed for successful MTPE task completion, such competence is expected to be learnt when becoming a translator. It also can be proven by the results of the first question, as it shows that nobody out 116 people, who work in translation field, does not consider themselves as a post-editor, but just as a translator.

Qs. 13 & 14. Is machine translation systems trained enough to make post-editing Lithuanian language worth it? and *is MT developed enough to provide a worth-editing output in Lithuanian when working with news texts?*

Last two questions, (Q. 13 and 14) are focused on Lithuanian language and MT system training in regards of the mentioned language. To start with question 13, the presented answers are: *yes, yes, but it still needs more training; no, MT is not trained enough; no, post-editing Lithuanian MT requires a lot of effort*. Such answers provide general knowledge if MT is sufficient to make post-editing LT worth the effort. As the results were collected, 62 (53.4 %) of respondents said that it is sufficient, but it needs more training, meaning that is not that difficult to post-edit LT, but it would help the process if MT output was better. On the contrary, 32 (27.6 %) think otherwise. They think that it is not worth it to post-edit Lithuanian MT.

The reasons are the same as previously discussed: poor MT output, inconsistency issues and market prices, which means low price for hard work. 17 (14.7 %) think that MT is not trained enough, and only 5 (4.3 %) think that MT is sufficient and trained enough to make post-editing LT worth it. The results suggest differences between translators and their point of view. Majority thinks that it is worth it, but MT needs to be improved to ease the process, while other half thinks that it is not and requires a lot of effort. All of this, as discussed previously, depends on other general factors like MT system used, text type, length of text etc. and that is why there is different views towards such question.

Secondly, question 14 is designed to approach post-editing from online news perspective. The respondents were asked to provide their opinion if MT is developed enough to provide editing worth output in LT when news texts are presented. As in theoretical analysis stated, such translation considers a lot of factors and there is different ways to translate such texts, but MT is not enough yet to fully translate such texts that would not need any post-editing.

As the 66 (56.9 %) of the respondents think, MT is sufficient to provide such output, but the target text needs to be fully post-edited to ensure the quality of such text. Such factors as easy understanding and readability, removing of "mechanical" language, consistency etc. needs to be ensured for such text to be considered good and ready to be published, and as it is known that MT texts sometimes are difficult to understand, read and have other issues proves the selection of the respondents. 33 (28.4 %) think otherwise. Their answer is based on competencies, and it is valid, as translator working as a journalistic text translator needs to have different competencies and knowledge in media field, to ensure that the translated text meets the standards and requirements of such texts, that's why raw MT is not enough. 11 (9.5 %) think that translation of news texts is difficult, which can be proven by what was mentioned before, while other 6 (5.2) respondents think that MT is sufficient. Once again, this proves the different point of view of individual translators and as it is visible from the results, some think that MT is developed enough to provide sufficient output for post-editing of such texts.

To conclude such analysis, it can be said that most respondents had 2 years of experience and were using *DeepL* and *Google translate* MT systems. Notably, data concerns and low quality of MT are still highlighted among the respondents, not only that but market pricing is of major significance to participants. Talking about frequency of post-editing tasks, such tasks are usually provided by LSPs. Despite variety of opinions, machine translation output is considered to be easier than translating without using such systems, but still necessitates the need of post-editing the text afterwards, as MT systems still provide poor quality and inconsistency issues. Moving on to Lithuanian language, the majority of respondents views are positive, saying that MT is suitable to provide output worth post-editing, but still needs further training, but they have different opinions on translation of news texts, because such texts are need of full post-editing to comply with the requirements of such texts. All in all, analysis identifies the gaps in MT that in a need of a fix, that if fixed would improve the general state of MTPE and its practices.

2.3. Light post-editing analysis of news text

To start this analysis, total 6 log files were collected, and drawbacks of the used software (*Translog)* were found. The main issue with the software is that it is not fully applied to Lithuanian language, or in other words, it was not trained to work with Lithuanian language as errors with punctuation were found.

This software does not allow to type Lithuanian quotation marks („ “), only one way to type them in works – by copying them from external source and pasting them into the text. Such way provides discomfort when editing, because neither quotation symbol (found on the keyboard), nor changing the language on operation system works. Additionally, post-editors tried to type the ALT code assigned to such symbol (ALT+0132; ALT+0147), but it seems that the software does not recognise the codes and the quotation marks still to be left English, unless pasted from external source.

Moving forward, time, changes made, and quality factors are analysed and presented below. The source text, MT translated text, and post-edited texts can be found in appendix 2 (see. appendix 2). In the appendix, the translators who post-edited the text will not be disclosed, but left anonymous and called translator 1, translator 2 etc.

Time factor

Time factor is a very variable factor when it comes to translating/post-editing texts. Such factor is based on several other factors. For example, the most influential factor, that affects the general time from starting to finishing a post-editing task is the quality of machine translation output. Machine translation output determines the time consumed while post-editing, because the better the quality of raw output, the shorter the time it will take to finish. As it is known, the quality is dependent on MT system that is used to prepare the text for post-editing, thus better system leads to better output and shorter time.

Other factors that influence completion time of such tasks include break times (when translator takes a break from working with such task), word count (the longer the text, the longer it will take), text type (translator may not be familiar with specific text genre) etc. It is important to note that the time cannot be estimated based on one translator, because such estimation does not consider the experience of translator, his workflow attributes, breaks, knowledge of the topic etc.

With this said, the fluctuation of time based on translators who post-edited the text is presented in the figure below (see fig. 4).

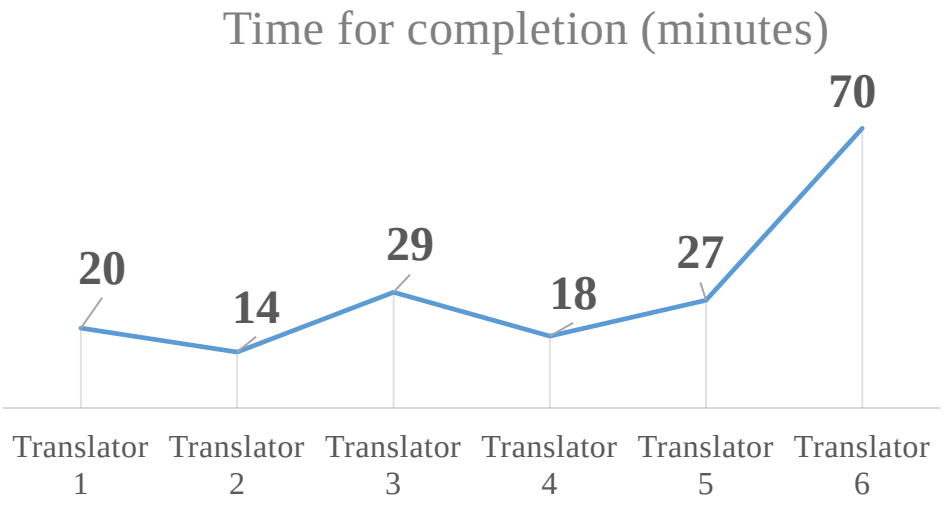

Fig. 4. Time fluctuation

As it is visible from the figure 4, the time difference between translators and their completion time fluctuates widely, with one translator taking up to 70 minutes (or 1 hour and 9 minutes), while most of the translators took up to 30 minutes to complete such a task, with the fastest being only 13 minutes and 58 seconds. Overall, the time it took to complete the task can be divided into several factors: reading, pausing, and editing (typing, deleting etc.). Reading time takes majority of the time, as the translator reads the TT, then compares it with ST, looking for any errors in the translation. The longer the text, the more time it takes to read and start post-editing.

After analysing the results, it can be said that the average reading time from turning on the program to starting to write/delete words is 124 seconds (2 minutes 4 seconds). To validate such finding a table is presented below (see table 1).

Table 2. Reading time from the start to first edit (in seconds)

	Reading time from the start to first edit (s)
Translator 1	**35 s**
Translator 2	**40 s**
Translator 3	**150 s**
Translator 4	**69 s**
Translator 5	**135 s**
Translator 6	**320 s**

This table represents the mentioned statement and validates the average reading time. It can be said that the highest reading time is 320 s, achieved by translator 6, which can be associated with some issues that translator may faced like not understanding the topic, searching for material, or browsing dictionaries. Certainly, it can be associated with only just reading, browsing the text, but *Translog* does not indicate any scrolling activity throughout the mentioned 320s. The fastest time is 35 seconds, done by translator 1, showing implications that the translator progressed through the text by reading and editing one sentence at the time. Like translator 1, rest of the translators done the same thing, except for translator 6, who started post-editing in the middle of the text, trying to change quotation marks.

These statements can be further explained by pause time. *Translog* statistics provide comprehensive pause time statistics, indicating how much pause time in total was done while post-editing, leading up to the completion time. The pause time shows processing time of the text, like decision making, reading, applying other actions like leaving the software etc. For instance, the pause time is similar to overall completion time in terms of its fluctuation. This factor is dependent on the translator capacity and his work process, for instance, the translator may check the post-edited text after he/she edited only one sentence, that makes a pause between editing. During this analysis, it can be said that most of the pauses that translators did last up to 1 minute, with few exceptions, as translator 6 pauses lasted up to 6 minutes, while for example translator 2 longest pause time was recorded up to 38.6 seconds.

Talking about the frequency of such pauses, the average of pause times is 28, meaning that pauses are done frequently, at different times, different locations in the text, length and once again influencing the workflow. Typing speed is very dependent on the translator, as every person has different typing speed, which also influences the overall time of the task completion. Such factor increases complexity of evaluating overall completion time.

With this said, the slowest text production per minute is 2.86 symbols (translator 6), while the fastest is 20.76 symbols per minute (translator 5). The average speed of other translators varies from 7.61 to 19.54 symbols per minute. It can be said that the slowest speed influenced the completion time by almost 50 minutes compared to translator whose speed is 12.61. Complexity here can be visualized when comparison between translators is done. Even though the translator types the fastest (translator 5), it does not mean that he completes the assignment faster than others, as he took 27 minutes, while others, having slower speed, finished faster than him/her, thus proving that the time and evaluation is not the same for each translator, making such time evaluation difficult and complex. Other factors like understanding text, reading, searching for material, and revision of edits cannot be excluded from such evaluation as it is crucial for the translator and to the quality of target text, which also complements complexity of such evaluation.

Changes made

To analyse the post-editing, it is worth to analyse what changes have been made throughout the post-editing process. Such overview provides a detailed examination of post-edited content and provides grounds to see if the translators have processed the task by applying the guidelines of light-post editing provided by ISO standard.

To start with, it is significant to examine statistics provided by *Translog*. Statistics are presented by a diagram displaying text inserted (symbols), text deleted (symbols), and miscellaneous actions that were done when doing the post-editing task (see fig. 5).

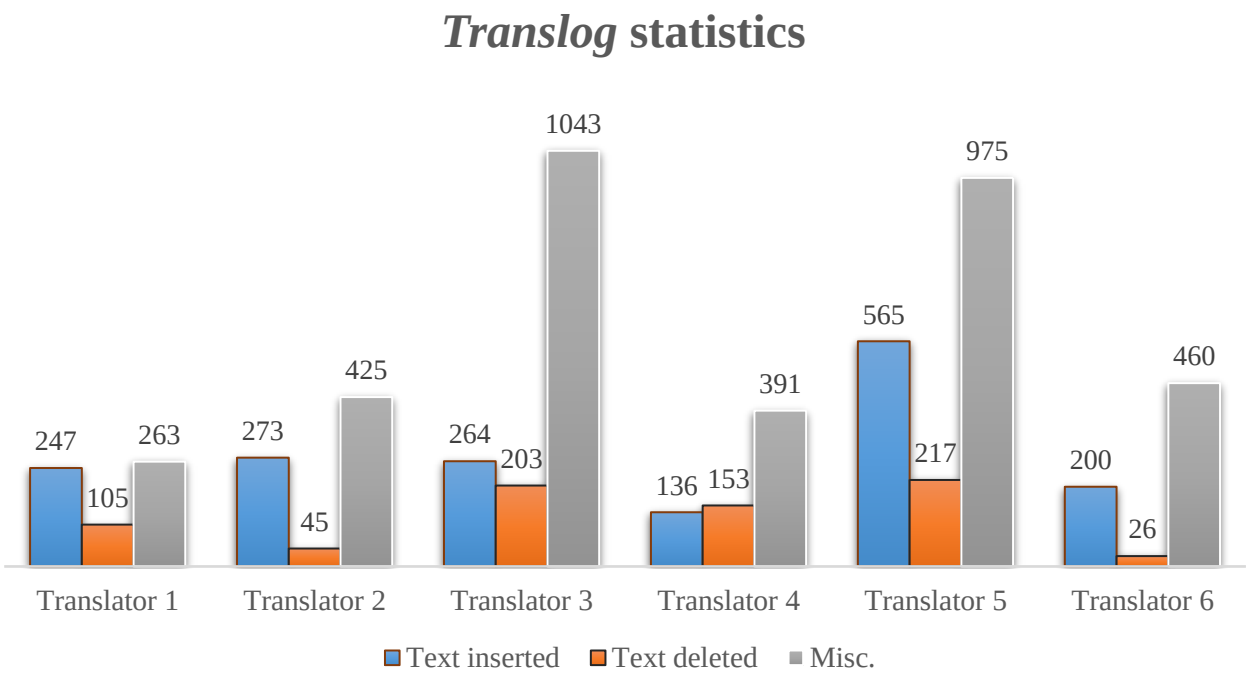

Fig. 5. *Translog* statistics

The diagram presented shows the variability of actions done when working with the task. As it can be seen, the miscellaneous actions were done the most, and as counted by the program, has the highest metrics from all three factors.

Miscellaneous actions stand for variety of actions done in or outside the program, that do not count to other categories like text inserted or text deleted. Such actions can include clicking of the program, scrolling, copying, and pasting, using macro commands like ALT codes etc. The highest number of the mentioned was done by translator 3 (1043), which means that the translator has done variety of things not related to text inserted or text deleted categories. As seen in the statistics, the translator did various actions, which mainly consider copying and pasting the text into the program. Such number means that translator may have used other tools to translate the text like other machine translation systems to maybe compare or edit straight in that system, nevertheless, the actions done are calculated and presented in the system. Translator 5 has the second highest metric – 975, but his log file presents not copying and pasting, but macro commands. The statistics show variety of micro commands used, for example CTRL + SHIFT + LEFT, which selects the text dependent on which arrow button is pressed (left, right, up, down). Another macro command used is CTRL + LEFT, which helps the translator by moving along words, the macro command moves along the text moving the cursor to the first letter of the word. His or her tactics provide an opportunity to work without a need of a mouse (unless necessary to move among programs or to search for information online), thus speeding up the process of translating and typing speed/deleting speeds. Other translators have lesser numbers of miscellaneous actions, like moving the mouse, setting the cursor, leaving the program etc. Analysing the text inserted, translator 5 has inserted the most words when post-editing (565), while translator 4 inserted the least number of words, nevertheless, such insertion/deletion statistics cannot evaluate the quality of the target text, same applies to deleted text.

Moving on, post-editing according to the light post-editing ISO standard and evaluation of changed text fragments is presented. For information purposes, translators were provided with ISO light post-editing standard guidelines, which states as follows: *to use as much MT as possible; to ensure that no information is added or omitted; to edit any inappropriate content; to reconstruct sentences in the case of incorrect or unclear meaning*. To simplify this analysis, considerable segments of all 6 translators are first, second, and fourteenth (segments can be found in appendix 2). Text will be style coded – bold shows, which fragment is placed instead in post-edited text. The table below (see table 2) represents the considered segments (second row contains ST, while the third one – *DeepL* translation.

Table 3. Analysed segments

First segment	Second segment	Fourteenth segment
After more than a year of anticipation leading up to Donald Trump's first criminal trial, it got underway Monday, offering a taste - and some clues - about the tone and legal strategies the next several weeks may bring.	We got a glimpse of Mr Trump's courtroom demeanour in a criminal trial. The prosecution's case finally crystallised around a grand theory of election interference as key witnesses laid the groundwork.	"I'm not allowed to say anything," he told reporters stationed just outside the courtroom doors on Tuesday, after a hearing about his gag order.
Po daugiau nei metus trukusio laukimo prieš pirmąjį Donaldo Trumpo baudžiamąjį teismo procesą, jis prasidėjo pirmadienį ir leido suprasti, kokiu tonu ir kokias teisines strategijas galima pasirinkti per kelias ateinančias savaites.	Išvydome, kaip D. Trumpas elgiasi teismo salėje baudžiamajame procese. Kaltinimo byla pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją, nes pagrindiniai liudytojai padėjo pagrindą.	"Man neleidžiama nieko sakyti", - sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų, antradienį, po posėdžio dėl jo įsakymo užčiaupti burną.

Starting with translator 1. The first segment had minor changes and goes as follows: *Po daugiau nei metus trukusio laukimo prieš pirmąjį Donaldo Trumpo baudžiamąjį teismo procesą,* ***kuris*** *prasidėjo pirmadienį ir* ***buvo galima suprasti****, kokiu tonu ir kokias teisines strategijas galima pasirinkti per kelias ateinančias savaites*. Such change clarifies the meaning of this segment because the word *jis* is changed to *kuris*, thus clarifying what process has started on Monday – the waiting time or the criminal trial (in this case, criminal trial).

Second part of the segment *leido suprasti* is changed to *buvo galima suprasti*, because the MT text contains personification, which is considered a mistake in Lithuanian language as object cannot be considered a person. For the second segment translator 1 applied such changes: *Išvydome, kaip D. Trumpas elgiasi teismo salėje* ***baudžiamojo proceso metu***. ***Pagrindiniams liudytojams padėjus pagrindą****, kaltinimo byla pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją*. First applied change to *baudžiamajame procese* to *baudžiamojo proceso metu* is because incorrect case is used, which in Lithuanian language is not applied to such cases. The translator fixes this issue by changing the case from where to when and additionally adding word *metu* to clarify the meaning. Same clarification is applied to the second part of the segment, text fragment *pagrindiniams liudytojams padėjus pagrindą* is moved from back to front, to clarify the meaning why did the crystallization happen. Lastly, Translator 1 implemented such alterations for the fourteenth segment: ***„****Man neleidžiama nieko sakyti****“****, – sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų, antradienį, po posėdžio,* ***kuriame jam buvo skirtas įsakymas*** *užčiaupti burną*. Alterations include changing the quotation marks to correct Lithuanian marks, and clarifying change, by which the general understanding of the sentence is improved.

Moving over to translator 2, first segment was edited as follows: *Po daugiau nei metus trukusio laukimo prieš pirmąjį Donaldo Trumpo baudžiamąjį bylos procesą, jis prasidėjo pirmadienį ir leido suprasti,* ***kokio tono ir kokių teisinių strategijų galima laukti*** *per kelias ateinančias savaites*. According to the change translator has applied, it can be understood that the MT translated sentence contained meaning and case issues, so to fix such issues, the translator has changed the case and few words to match what is meant to be said. MT translated the words *may bring* as *galima pasirinkti* (Eng. may choose), which is not the correct meaning, thus translator had to correct it and changed it to *galima laukti*. Second segment was amended as presented: *Išvydome, kaip D. Trumpas elgiasi teismo salėje* ***baudžiamosios bylos metu***. *Kaltinimo byla pagaliau* ***išryškėjo*** *ties didžiąja kišimosi į rinkimus teorija, nes pagrindiniai liudytojai padėjo pagrindą*. Translator 2 has done the same correction as translator 1 and changed *baudžiamajame procese* to *baudžiamojo proceso metu*. The second sentence of the segment contains a change from *išsikristalizavo* to *išryškėjo*. This is done because MT has not considered the meaning of the word *išsikristalizavo* and translated it literally, while the true meaning of this word is *išryškėjo* (as the translator corrected), which in English means *uncovered*. For the fourteenth segment, changes were done as follows: ***„****Man neleidžiama nieko sakyti****“****, – sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų, antradienį, po posėdžio dėl* ***įsakymo jam tylėti***. By editing, words *užčiaupti burną* are removed, which may be considered as inappropriate language, instead *jam tylėti* are inputted to make it sound less aggressive.

Translator 3 has completely altered the first segment: ***Pirmadienį prasidėjo po daugiau nei metus trukusio*** *Donaldo Trumpo pirmosios* ***baudžiamosios bylos nagrinėjimo procesas****, kuris leido suprasti, kokiu tonu ir kokias teisines strategijas galima* ***taikyti*** *per kelias ateinančias savaites*. This segment is reconstructed completely, because of the lack of clear meaning in the MT sentence, that is why translator decided to restructure. Second edit removes the word *pasirinkti* and changes it with the word *taikyti*. Once again, this change is introduced seeking to improve the unclear meaning of the sentence, but more clearer words could be chosen, like *galima laukti*. Second segment is amended as follows: *Išvydome, kaip D. Trumpas elgiasi teismo salėje baudžiamosios bylos nagrinėjimo procese. Kaltinimo byla pagaliau* ***išryškėjo*** *aplink didžiąją teoriją* ***apie kišimąsi į rinkimus****, kai pagrindiniai liudytojai padėjo pagrindą*. Word *išryškėjo* is used instead of *išsikristalizavo* because of the unclear meaning (same change was done by translator 2), same applies to the second change *apie kišimąsi į rinkimus* although not that necessary. Moving on to the fourteenth segment, translator 3 decided to alter it as stated: *Man neleidžiama nieko sakyti, – sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų, antradienį, po posėdžio dėl jo įsakymo* ***susilaikyti nuo informacijos skleidimo***. Firstly, it is not sure why did the translator remove the quotation marks, it may be because of the program not allowing ALT codes or input by pressing keyboard button. Second change is done to represent what is being meant by gag order, thus, to change the inappropriate words *užčiaupti burną*, the translator decided to translate the meaning of the order and edited it accordingly.

Proceeding to translator number 4, the first segment was changed like presented: *Po daugiau nei metus trukusio laukimo prieš pirmąjį Donaldo Trumpo baudžiamąjį teismo procesą,* ***kuris prasidėjo pirmadienį****, leido suprasti,* ***koks tonas ir kokias teisines strategijas bus galima išvysti*** *per kelias ateinančias savaites*. First change is associated with personification being presented in MT (*jis prasidėjo pirmadienį*), that is why the translator decided to correct this issue and replace it with *kuris prasidėjo pirmadienį*. Translator also decided to skip the word *and*, replacing it with a comma, thus the meaning of what is being said is clearer. Additionally, the translator reconstructed the second part of the segment to make it correspond to the source text meaning. Proceeding to second segment, it is changed as follows: *Išvydome, kaip* ***baudžiamojo proceso metu*** *D. Trumpas elgiasi teismo salėje. Kaltinimo byla pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją, nes pagrindiniai liudytojai padėjo pagrindą*. This is a repetitive change among the translators (see analysis of translator 1), done to improve the meaning of the sentence, what is different is that the translator decided to move the words to the front, which makes the sentence easier to read. For the fourteenth segment, the translator has only changed the punctuation marks.

Moving forward to the analysis of translator 5, who has inputted most of the text while post-editing (see fig. 5). First edited segment goes as follows: ***Pirmadienį prasidėjo daugiau nei metus lauktas pirmasis Donaldo Trumpo baudžiamojo teismo procesas ir leido suprasti, kokio tono ir kokių teisinių strategijų galima tikėtis*** *per kelias ateinančias savaites*. As seen from the changed text, the translator decided to fully reconstruct the segment, changing the word order, and choosing more suitable words in terms of meaning, like word *tikėtis* over *pasirinkti*, thus clarifying what is being said and providing easier reading. Forward to second segment: *Išvydome, kaip D. Trumpas elgiasi teismo salėje* ***baudžiamojo proceso metu***. ***Baudžiamoji byla*** *pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją, nes* ***tokį pagrindą padėjo*** *pagrindiniai liudytojai*. First change has been discussed previously, but the second is exceptional from all of the other post-edits. *Kaltinimo byla* is not the right meaning term that is used by MT and this translator has spotted such issue, so to clarify he used a more suitable word *baudžiamoji byla*, which is presents the true meaning.

Additionally, this issue can be treated as a consistency error because words *criminal trial* and *prosecution's case* in Lithuanian mean *baudžiamoji byla* (depending on the context). Second change is made to clarify and ease the reading process. Translator decided to amend the fourteenth segment as follows: *"Man neleidžiama nieko sakyti", – sakė jis žurnalistams**, laukusiems** prie pat teismo salės durų antradienį, po posėdžio**, kai jam neleido viešinti smulkmenų***. Word *laukusiems* is inserted instead of the word *įsikūrusiems*, which means that the reporters are living there, while the word *laukusiems* means that they are waiting at the door, thus better corresponding to the ST. The second part (*kai jam neleido viešinti smulkmenų*) is done similarly to translator 3, by explaining what is being meant by gag order.

Lastly, translator 6, who took the longest to finish the task. Amendments done to the first segment are as follows: *Po daugiau nei metus trukusio laukimo **iki** pirmojo Donaldo Trumpo baudžiamojo teismo proceso, jis prasidėjo pirmadienį ir leido suprasti, kokio tono ir kokių teisinių strategijų **galima laukti** per kelias ateinančias savaites*. The first change (word *prieš* changed to *iki*) clears the meaning of what is being said and creates coherency throughout the sentence. Second change: *galima laukti* is inserted instead of the words *galima pasirinkti*, because *galima pasirinkti* does not correspond to the meaning of the sentence and the words *may bring* in ST. Second segment amended as follows: *Išvydome, kaip **ponas** Trumpas elgiasi teismo salėje baudžiamajame procese. Kaltinimo byla pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją, nes pagrindiniai liudytojai padėjo pagrindą*. Word *ponas* (Eng. mister) is added replacing the need of repeating the name abbreviation (*D.)* although such change is not necessary. Lastly, the fourteenth segment: *"Man neleidžiama nieko sakyti", - antradienį po posėdžio **dėl draudimo skleisti informaciją**, sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų*. Half of the segment is reconstructed in order to ease readability of such sentence. The back part *po posėdžio dėl jo įsakymo užčiaupti burną* is transferred to the front of the sentence, additionally explaining the words *gag order* by translating their meaning and applying to the text. This way such sentence provides easier reading experience and clarifies the meaning to make the text understandable.

Comments

Translators were asked to comment on the task, process, and overall impression. As said by translator 1, translation of such genre seems to have provided difficulties to machine translation output. As the translator was translating, he/she noticed variety of mistakes, incorrect quotation marks being the most obvious ones while reading, but when starting to post-edit – issues of MT not understanding the text were spotted, thus needing amendments to make such sentences readable and understandable.

Translator 3 says that for him/her, the source text was hard to understand, even if the translation with *DeepL* is present. The translator provided an example of the word *gag order*, which, as he/she states, was a new term to learn. As the translation of the term *gag order* (*įsakymo užčiaupti burną*) did not suit his view, the translator decided to change it by expressing such order by its meaning, translating it as *įsakymo susilaikyti nuo informacijos skleidimo* (Eng. *an order to refrain from disseminating information*). Overall, his experience was new, but he stated that light post-editing does not suite such genre, as MT is not sufficient.

Translator 5, having more experience than others, have implemented various reconstructive translation strategies, to improve the output of MT. By his/her words, such MT output it not suitable for such genre of texts. *News text require a lot of human input and various knowledge of different fields, not to mention strategies, that could be used when translating news. Post-editing the text with light post-editing guidelines proved to be a difficult task, as the quality of the output required more effort than ISO light post-editing guidelines could allow to be used*. Comment of translator shows the complexity of online news translation, that various experience and knowledge is needed to translate such texts. From his/her standpoint, light post-editing provides minimal use for translation of needs, they do not make the text complete quality wise, as much more editing needs to be done.

Quality factor

To finish this assessment, quality factor is upmost importance to distinguish. When describing changes made section, ISO standard light post-editing guidelines were applied to outline how much time is needed to finish such news post-editing task and what changes were made in order to complete it. In order to evaluate quality, adherence to mentioned guidelines is a must.

With that stated, the translators were consistent with the guidelines ensuring that most of the MT translation would be left unchanged. In some cases, translators applied reconstruction of segments, as machine translated source text presented a hardly understandable segment translation and the main idea of the segment was not present or difficult to understand. After reviewing the completed tasks, it can be said, that no additional words or omissions of ST were found. The only additions and deletions were done by translators to ensure readability and make the text understandable enough as stated in the ISO standard, but not for public use of such text. Inappropriate content is to be considered, as one repetitive case was found in such text but is to be evaluated if the words *užčiaupti burną* could be held as inappropriate words. Some of the translator edited this specific case, some did not.

Post-editing variability is also visible in the completed task. Each translator demonstrates different post-editing ways and their ability to understand and appropriately edit the MT text, with different variation of changes visible throughout examination of three segments edited by each translator. It also can be said that some translators added minor adjustments and try to leave as much MT text as possible, while others apply reconstruction to improve clarity and coherence, by which implies, that light post-editing is not enough for news text.

Attention to linguistic details also provided by the translators, who have succeeded to ensure consistent terminology, grammar and syntax, as the MT text had issues that created difficulties to understand and to read without any post-editing, thus again proving that light post-editing is not enough for such machine translation to translate news text (or at least this specific genre).

Moving on, balancing of efficiency and quality is visible among translators, even though the guidelines were presented. Some translators have done intensive segment reconstruction, while others tried to be more efficient and follow the guidelines, only changing the parts that must be changed in order to make the segment understandable and readable.

As for comments, all comments discussed provides information about MT, its quality, and general comments about such type of a task.

Translators validate light post-editing being insufficient for such type of texts, as a lot more editing needs to be done to make it readable and understandable. Furthermore, experience is needed for successful translation of such texts because various strategies need to be implemented while translating/post-editing news.

Overall, it cannot be stated that every translator adhered to the provided guidelines as much as possible, but it is visible that attention was paid to them. With that said, light post-editing practices are not enough to convert such genre of the text into a readable and understandable material that could be presented to general audiences. Such statement is also validated by question 14 in section 2.1 (see section 2.1), in which respondents stated that MT output of online news texts needs to be fully post-edited as MT quality is not good enough to make the mentioned texts fully understandable and good quality wise, even if light post-editing practices are applied.

2.4. Research closing statement

The assessment, comprising both a survey analysis and an evaluation of the post-editing task, displays several critical aspects of the translation process and work particularities that translator has to face in order to complete a post-editing task. Display of nuances and challenges are also visible and presented with general analysis, revealing complex relation between post-editing, translator, and MT.

Responses to the survey reveals factors that influence the performance of a translator. While MT has its benefits, like preparing the structure of the sentence with main idea already seen, its significant drawbacks overcome the benefits, influencing performance, time and effort needed to complete a post-editing task editing from English to Lithuanian. Various opinions are brought to such discussion of MT and its quality, nevertheless its output is still considered (by majority) a critical factor in such line of work, on the other hand providing to be an easier task than translating without using machine translation systems. Machine translation of Lithuanian, according to the survey, is suitable to provide an effort worthy post-editing task, but still shows necessity for further development of MT systems. Genre specific post-editing tasks, in this case – news, are considered to be possible, but light post-editing is not sufficient enough to make such text easy to read and understand, or to correspond to the requirements of such text. Generally, survey displays the factors that need to be considered by MT systems developers, to look in the displayed issues and drawbacks, to ensure easier completion of post-editing tasks, additionally ease the workflow of a translator.

Considering the post-editing task analysis, study of completion time is considerably one of the most complex variables to analyse, providing deeper view of factors that influence completion of post-editing tasks. Analysis presents completion time fluctuations among translators, that are influenced by quality of MT, text genre and its complexity, individuality of each translator, reading and typing speeds. Nevertheless, translators were able to adhere to the provided ISO light post-editing guidelines, by leaving as much raw MT text as possible, while applying changes to those sentences, which show meaning issues. Individuality is presented by each translator, by different completion/starting time, edited segments and changes made. Some of the translators tried to be as close as possible to the provided guidelines, with minor amendments made to the machine translation output, while others decided to make bigger adjustments by reconstructing segments to enhance readability and coherence.

Nonetheless, following such methodology of post-editing the text adhering to the ISO light post-editing guidelines proved to be insufficient when dealing with such genre of text. As survey, comments and post-editing task analysis shows, such texts need more attentive and wider post-editing, so they could be presented to public audience, as light post-editing does not include various factors that need to be edited. Following the statement, translators' effort to post-edit the text proved to be difficult, facing many issues, which showed a need of full post-editing practices to make the text clear, easy to read and understand.

Conclusions

After theoretical analysis and conduction of the study, the following conclusions are made regarding the theoretical material presented and survey and MTPE task completion.

1. Exploration of theory regarding machine translation and post-editing practices in low-resource languages, outlines the importance of human translators and the need of further studies to improve the general state of translation. The mentioned theory examined outlines the relation of these four factors and current state of such practices, viewing and comparing machine translation evolution by the quality of output that can be produced. Even though its progress is visible, challenges present influence post-editing practices and workflow of a translator, emphasizing importance of further advancement of machine translation systems.
2. News media is considerably one the most influenced fields by digitalization. In a view of the field being primary source of global/local information, translation of such serves a role of providing newest information as fast as possible. Machine translation technologies improves the speed of production, introducing opportunities and challenges when post-editing such content for public and emphasizing importance of human supervision and input in the post-editing process.
3. By conducting a survey, thoughts of translators are visualised, providing valuable insights into current state of machine translation and post-editing practices. The findings outline the current views towards machine translation in Lithuanian machine translation industry and post-editing practices. Survey discloses valuable information of various factors considering MT and MTPE, revealing main issues that translators are facing in the market, like poor quality of MT and/or low pay rates of MTPE tasks. Effort towards such tasks proves to be dependent on machine translation systems, as relation to post-editing tasks is primarily based on translators' attitude towards machine translation and its quality, not to mention data security concerns that were highlighted among the respondents. Mentioned machine translation factor is variable from system to system, despite it being improved, necessity of post-editing is still a key to sufficient quality. News field specific post-editing tasks, as per respondents, are considered to be doable with the current state of machine translation, but the output needs to fully post-edited, as such field necessitates various knowledge, translation strategies and quality.
4. Research of post-editing practice done by using *Translog* provided insights into overall workflow of a translator, with opportunity to distinguish completion time complexity, analyse changes made to the machine translated text, and evaluate the quality adherence to ISO light post-editing guidelines. Time proved to be a complex factor when evaluating with numerous variables like break and reading times, typing speed, pause time etc. distinguishing the variability and translators' individuality. Changes made during the post-editing process displayed efficiency and quality differences among the translators as the text prepared by *DeepL* had more issues that could not be fixed by applying light post-editing guidelines, thus some chose to adhere to the mentioned as much as possible by applying minor adjustments, while others implemented various segment reconstruction strategies as the found is lack of clarity and meaning in the translated segments. Quality wise, the methodology used showed limitations as mentioned previously, as it is too narrow and does not consider variety of other factors that required post-editing during such task.

As stated by respondents, visualised in the task, and said by the translators after task completion, MT is not yet capable of translating such tasks on its own to be good quality wise, thus full post-editing practices need to be applied, as light post-editing practices proved to be insufficient.

Recommendations: after the conducted study, it can be said further investigation of MT output is needed, specifically in EN-LT-EN language combination, as survey distinguishes current drawbacks of MTPE tasks in the mentioned language combination. Investigation and liquidation of such drawbacks would improve the general process of post-editing practices. Secondly, post-editing practices of specific fields texts still need further investigation and research towards how such processes could be improved. All these mentioned could be done based on research presented in this thesis.

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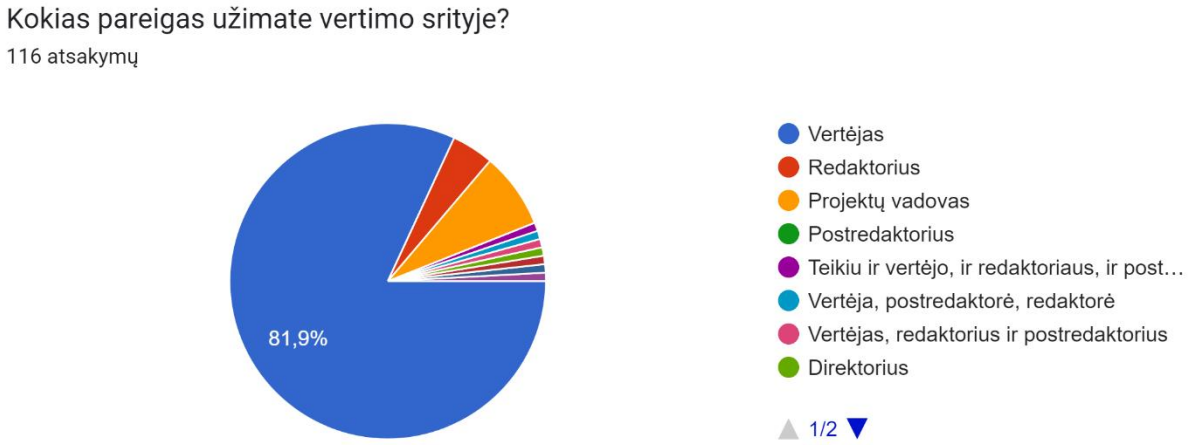
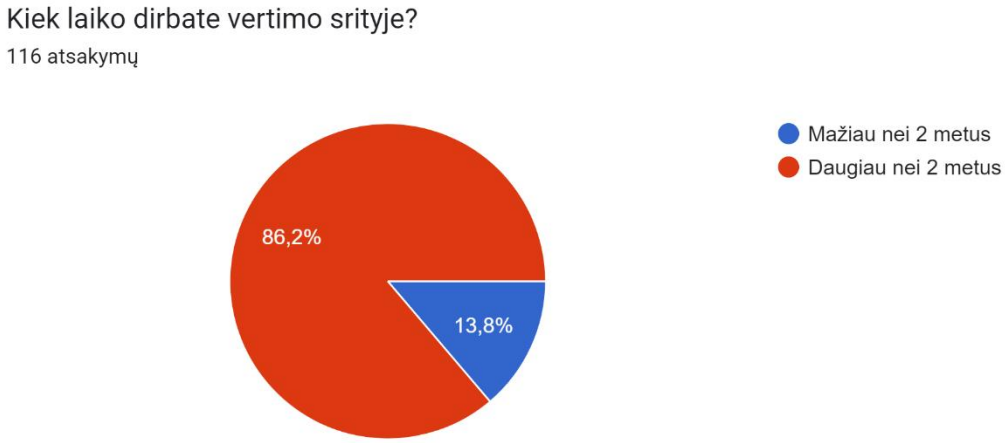
Appendices

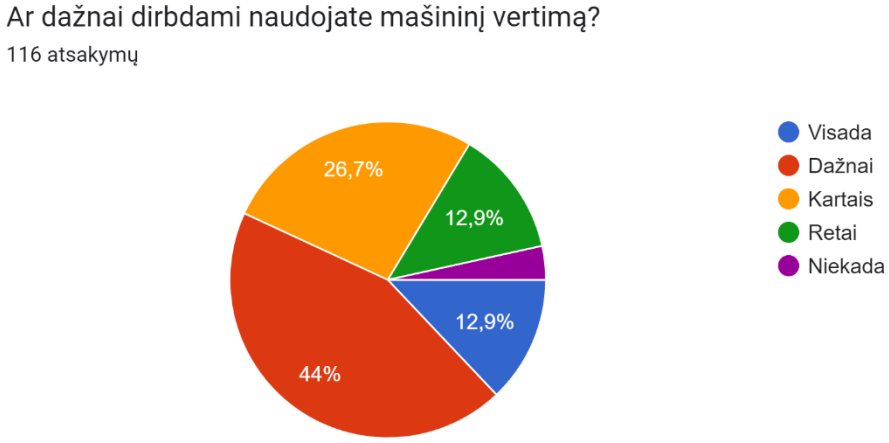
Appendix 1. Link to survey and diagrams

Link: https://forms.gle/LS6ABpKm7jgtNZ3H9

Diagrams:

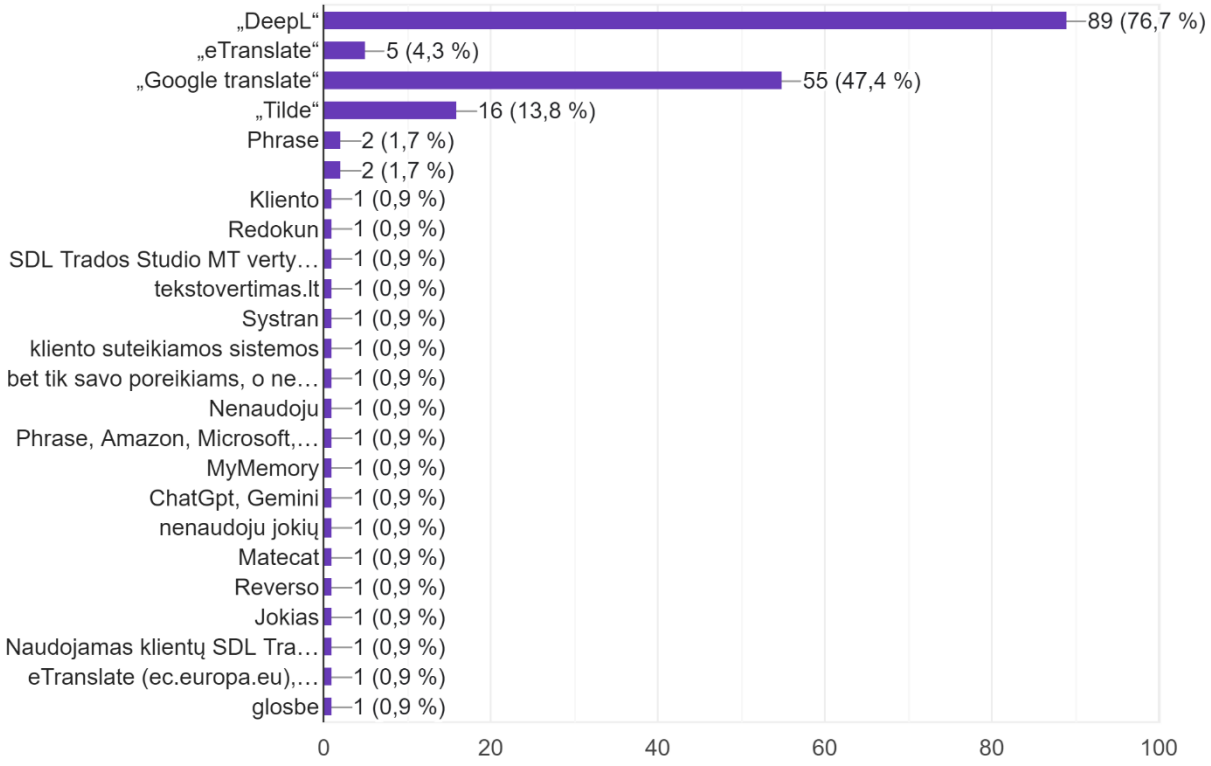






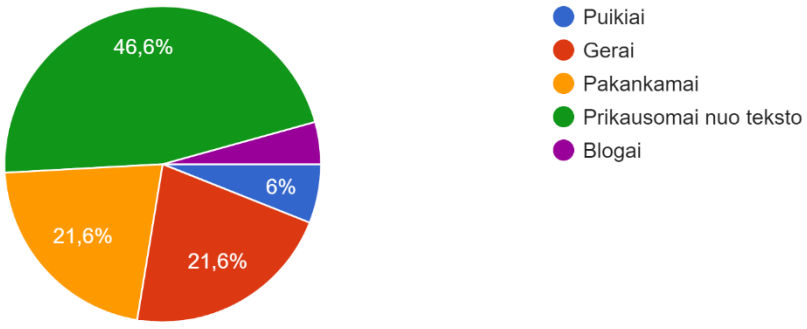
Kokias MV sistemas naudojate?

116 atsakymų



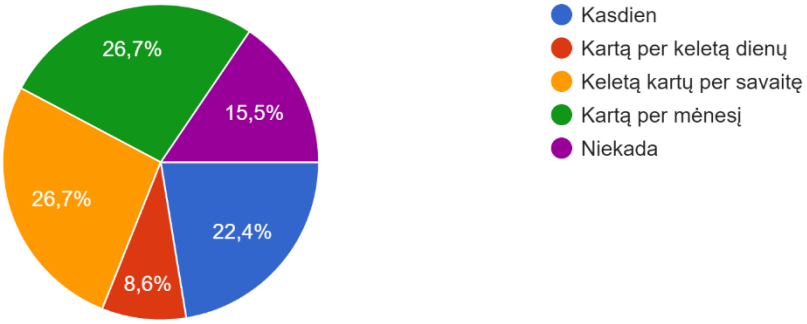
Kaip vertinate MV sistemų vertimo kokybę?

116 atsakymų



Ar dažnai tenka susidurti su postredagavimo užduotimis (kai tekstas jau išverstas MV)?

116 atsakymų

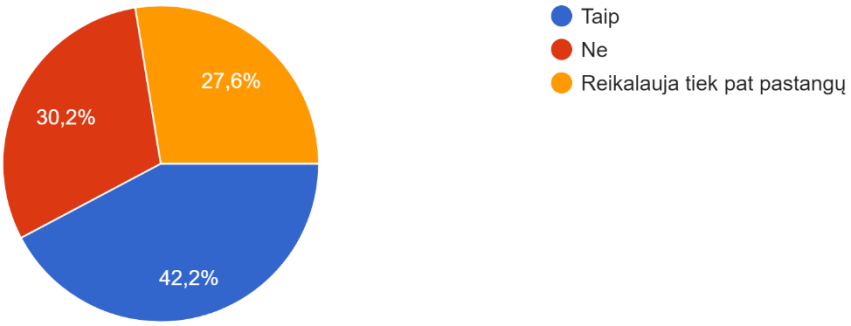


Kodėl atliekate mašininio vertimo postredagavimą?

116 atsakymų

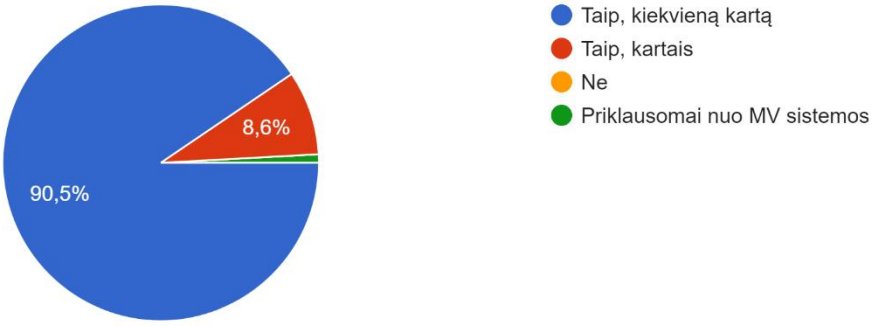
Ar MV postredagavimas yra lengvesnė užduotis nei vertimas nesinaudojant MV?

116 atsakymų



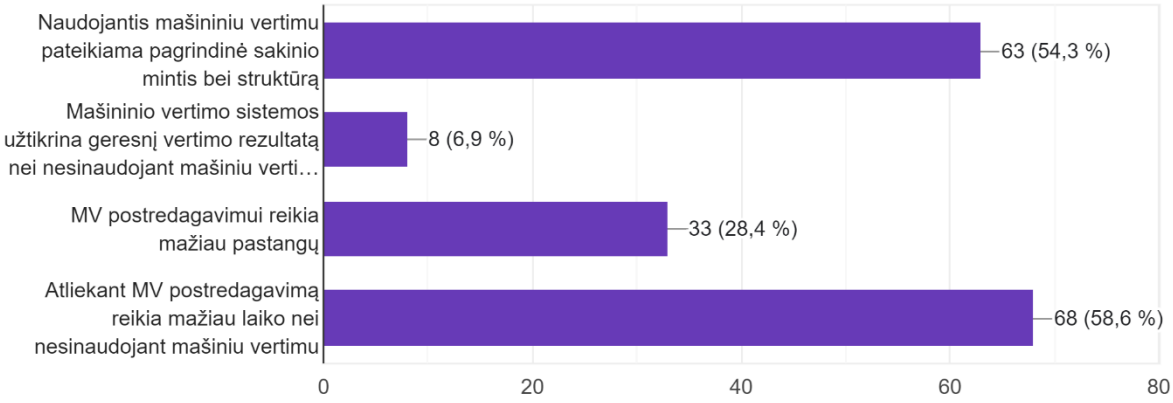
Ar MV tekstui reikalingas postredagavimas?

116 atsakymų



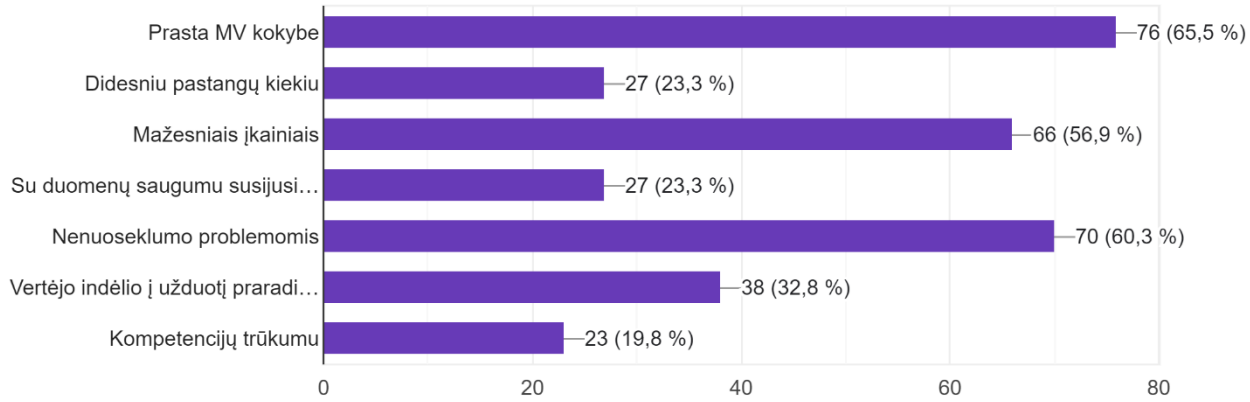
Ar galėtumėte nurodyti, kodėl MV postredagavimas yra patogesnis už vertimą nesinaudojant MV? (Pasirinkite kelis variantus)

116 atsakymų



Ar susiduriate su paminėtais MV postredagavimo trūkumais? (Pasirinkite kelis variantus)

116 atsakymų

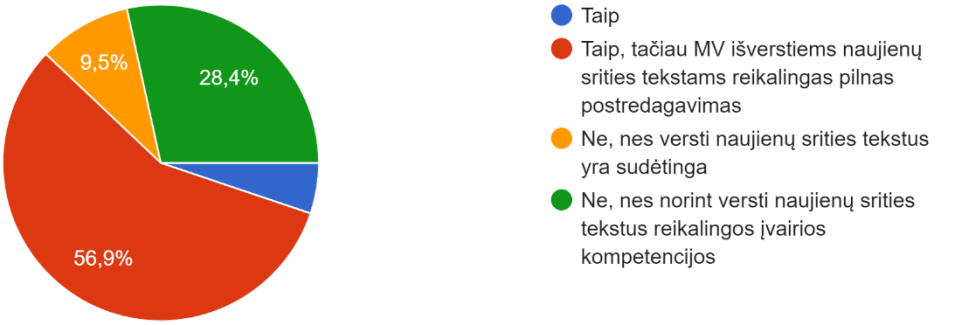


Ar MV sistemos yra pakankamai pritaikytos lietuvių kalbos postredagavimui?

116 atsakymų

Remiantis ankstesniais klausimais, ar galima teigti, kad MV yra pakankamai pritaikytas naujienų srities tekstų postredagavimui lietuvių kalba?

116 atsakymų



Appendix 2. Light post-editing task material

Original source text

After more than a year of anticipation leading up to Donald Trump's first criminal trial, it got underway Monday, offering a taste - and some clues - about the tone and legal strategies the next several weeks may bring.

We got a glimpse of Mr Trump's courtroom demeanour in a criminal trial. The prosecution's case finally crystallised around a grand theory of election interference as key witnesses laid the groundwork.

And flashes of tension may have opened a rift between Judge Juan Merchan and Mr Trump's lead attorney.

A marathon for Trump

Something that became immediately clear in court is that this trial will be an endurance test, perhaps for Mr Trump most of all.

For the last year, the 77-year-old has actively campaigned for president during cases where he wasn't required to be present. Now, he must appear in court each day of this trial. That means Mr Trump will sit for hours at the defence table.

The former president appears thinner - he told Fox News in January that he lost weight - and his stride varies. At times, he moves slower, and at others, he confidently strides into courtroom - the same one where he sat a year ago for his arraignment pleading not guilty to all 34 felony charges.

Also unlike previous civil trials, when Mr Trump made audible comments from the defence table and argued with judges, he has been far more compliant.

"One interesting dynamic is how differently Trump the criminal defendant is behaving, in comparison to Trump the civil litigant," said Anna Cominsky, a professor at New York Law School.

"We have seen a much more subdued and controlled Trump while he is in front of the jury."

During the proceedings, he confers with his lead attorney, Todd Blanche, in urgent whispers.

"It's an incredibly difficult process to sit through, especially trials like this that may last many, many weeks," said Dmitriy Shakhnevich, a criminal defence attorney in Manhattan.

Mr Trump repeatedly has aired his frustrations publicly.

"I'm not allowed to say anything," he told reporters stationed just outside the courtroom doors on Tuesday, after a hearing about his gag order.

'I'd love to say everything that's on my mind," he added.

What we learned about the Manhattan District Attorney's case

At the heart of the case is the alleged cover-up of a hush money payment Mr Trump's lawyer made to an adult film star before the 2016 election, but prosecutors have hinted for months at something greater.

This week, they solidified their case.

"This was a planned, coordinated, long-running conspiracy to influence the 2016 election," prosecutor Matthew Colangelo said in his opening remarks Monday.

"It was election fraud, pure and simple," Mr Colangelo later added.

They aim to convince the jury not only that Mr Trump committed the misdemeanour of falsifying business records to hide a hush money payment carried out by his lawyer, but that he did so in order to conceal or aid a second crime, making the offense more serious.

Prosecutors have suggested Mr Trump sought to violate state or federal election laws, and state tax laws, and Manhattan District Attorney Alvin Bragg hinted his team would pursue an election interference argument.

Their first witness, former National Enquirer publisher David Pecker, helped bolster this case.

He testified about an "agreement" involving himself, Mr Trump and lawyer Michael Cohen to use the tabloid to boost Mr Trump's 2016 campaign. Mr Pecker testified he agreed to provide positive coverage of Trump and head off potentially damaging stories.

Payouts Mr Pecker facilitated to block one such story also may have run afoul of federal election laws, prosecutors suggested through the questioning.

Text translated using *DeepL*

Po daugiau nei metus trukusio laukimo prieš pirmąjį Donaldo Trumpo baudžiamąjį teismo procesą, jis prasidėjo pirmadienį ir leido suprasti, kokiu tonu ir kokias teisines strategijas galima pasirinkti per kelias ateinančias savaites.

Išvydome, kaip D. Trumpas elgiasi teismo salėje baudžiamajame procese. Kaltinimo byla pagaliau išsikristalizavo aplink didžiąją kišimosi į rinkimus teoriją, nes pagrindiniai liudytojai padėjo pagrindą.

O įtampos blyksniai galėjo atverti teisėjo Chuano Merčano ir D. Trumpo pagrindinio advokato nesutarimus.

D. Trumpo maratonas

Teisme iš karto paaiškėjo, kad šis teismo procesas bus ištvermės išbandymas, galbūt labiausiai D. Trumpui.

Pastaruosius metus 77-erių metų D. Trumpas aktyviai dalyvavo prezidento rinkimų kampanijoje per bylas, kuriose jam nereikėjo dalyvauti. Dabar jis privalo atvykti į teismą kiekvieną šio proceso dieną. Tai reiškia, kad D. Trumpui teks valandų valandas sėdėti prie gynybos stalo.

Buvęs prezidentas atrodo lieknesnis - sausį jis sakė "Fox News", kad numetė svorio - ir jo žingsnis svyruoja. Kai kada jis juda lėčiau, o kai kada užtikrintai žingsniuoja į teismo salę - tą pačią, kurioje prieš metus sėdėjo per kaltinamąjį aktą, pripažindamas savo kaltę dėl visų 34 kaltinimų sunkiais nusikaltimais.

Be to, kitaip nei ankstesniuose civiliniuose procesuose, kai D. Trumpas nuo gynybos stalo garsiai komentuodavo ir ginčydavosi su teisėjais, dabar jis elgėsi kur kas paklusniau.

"Įdomi dinamika yra ta, kaip skirtingai elgiasi D. Trumpas - baudžiamosios bylos kaltinamasis, palyginti su D. Trumpu - civilinės bylos dalyviu, - sakė Niujorko teisės mokyklos profesorė Anna Cominsky.

"Matėme daug santūresnį ir labiau kontroliuojamą Trumpą, kai jis buvo priešais prisiekusiuosius."

Bylos nagrinėjimo metu jis skubiai šnabždėdamasis tariasi su savo pagrindiniu advokatu Toddu Blanšu.

"Tai neįtikėtinai sunkus procesas, ypač tokie teismo procesai, kurie gali trukti daug, daug savaičių", - sakė Dmitrijus Šachnevičius, baudžiamųjų bylų advokatas Manhatane.

D. Trumpas ne kartą viešai reiškė savo nusivylimą.

"Man neleidžiama nieko sakyti", - sakė jis žurnalistams, įsikūrusiems prie pat teismo salės durų, antradienį, po posėdžio dėl jo įsakymo užčiaupti burną.

"Norėčiau pasakyti viską, kas dedasi mano galvoje", - pridūrė jis.

Ką sužinojome apie Manhatano apygardos prokuroro bylą

Šios bylos esmė - įtariamas slaptų pinigų mokėjimo, kurį D. Trumpo advokatas prieš 2016 m. rinkimus sumokėjo suaugusiųjų filmų žvaigždei, slėpimas, tačiau prokurorai kelis mėnesius užsiminė apie kai ką didesnio.

Šią savaitę jie dar labiau sustiprino savo bylą.

"Tai buvo suplanuotas, koordinuotas, ilgai trukęs sąmokslas siekiant paveikti 2016 m. rinkimus", - pirmadienį įžanginėje kalboje sakė prokuroras Matthew Colangelo.

"Tai buvo grynas ir paprastas rinkimų klastojimas", - vėliau pridūrė M. Colangelo.

Jie siekia įtikinti prisiekusiuosius, kad D. Trumpas ne tik padarė nusižengimą - suklastojo verslo dokumentus, kad nuslėptų savo advokato atliktą tylėjimo pinigų mokėjimą, bet ir kad tai padarė siekdamas nuslėpti ar padėti įvykdyti antrą nusikaltimą, todėl nusikaltimas yra sunkesnis. Prokurorai užsiminė, kad D. Trumpas siekė pažeisti valstijos ar federalinius rinkimų įstatymus ir valstijos mokesčių įstatymus, o Manhatano apygardos prokuroras Alvinas Braggas užsiminė, kad jo komanda sieks pateikti argumentą dėl kišimosi į rinkimus.

Pirmasis jų liudytojas, buvęs leidinio "National Enquirer" leidėjas Davidas Peckeris, padėjo sustiprinti šią bylą.

Jis liudijo apie "susitarimą", kuriame dalyvavo jis, D. Trumpas ir advokatas Michaelas Cohenas, panaudoti bulvarinį laikraštį D. Trumpo 2016 m. kampanijai skatinti. D. Peckeris liudijo, kad sutiko teigiamai nušviesti D. Trumpą ir užkirsti kelią potencialiai žalingoms istorijoms.

Apklausos metu prokurorai užsiminė, kad išmokos, kurias P. Peckeris padėjo išmokėti, kad užblokuotų vieną tokią istoriją, taip pat galėjo prieštarauti federaliniams rinkimų įstatymams.