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SUPERIORITY OF HUMAN TRANSLATION OVER MACHINE TRANSLATION

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ABOUT ARTICLE

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Abstract: This research explores the ongoing discussions regarding the capabilities and differences between artificial intelligence and human translators, especially in light of the rapid advancements in machine translation (MT) technologies. By analyzing two texts with distinct styles – the scientific work A Brief History of Time by Stephen Hawking and the fiction novel To Kill a Mockingbird by Harper Lee – the study examines the advantages of human manual translation over machine translation. A comparison of how machine translation works with human translation was done in various stylistic areas. The findings show that professional translators produce better results, because they use their language skills, cultural knowledge and expertise to maintain the original text's meaning and tone.However, machine translation is still not able to grasp the cultural and emotional significance of materials found in literature. The investigation found that despite AI, human translation maintains its natural characteristics.

There are situations where accuracy and attention to cultural customs are vital and so human translation is needed.

Introduction. This thesis aims to explore the advantages of human manual translation compared to machine translation systems based on the analysis of two texts written in different styles: artistic and scientific. The study, based on examples from Stephen Hawking's “A Brief History of Time” and Harper Lee's “To Kill a Mockingbird”, reflects the inherent nature of human translation despite the age of artificial intelligence. The intensive use of MT in a person's daily life is becoming the subject of discussions about its advantages and disadvantages in comparison with human translators. However, the rare ability of MT to retain cultural nuances, linguistic authenticity, and meaning within the context still raises questions, despite the fact that they are progressing significantly.

The field of translation has grown dramatically with the advent of artificial intelligence systems, and programs such as Google Translate, DeepL and others, MT tools that provide instant translations, are becoming more and more in demand each time. Translation implies the preservation of tone, contextual understanding, and cultural nuances, which human translators intuitively succeed at. Machine translators are often unable to reliably convey these aspects, which makes it doubtful that they will be able to fully replace humans in translating complex and non-standard materials.

The choice of Harper Lee's To Kill a Mockingbird and Stephen Hawking's A Brief History of Time is based on the unique characteristics of the genres and the difficulties associated with translation. The selected works are written in two different genres: fiction and popular science. These differences make it possible to conduct a comprehensive analysis of the translation approaches used depending on the type of work (Smith, 2020)."

“A Brief History of Time” is a popular science work in which consistency and correctness play a significant role. The interpretation and adaptation of complex ideas for the target audience remains an open question, despite the effectiveness of terminology in translation. Scientific concepts such as quantum mechanics require an in-depth study of the subject from the translator. This work can be considered as an example of a text that compares the advantages and disadvantages of MT and HT in the scientific field.

"To Kill a Mockingbird" presents fiction filled with cultural and social contexts, as well as emotional depth. This work serves as an example of a text in which the State of emergency is a key aspect for retaining cultural features and artistic significance. The novel uses figurative expressions, regional language features, which are important for interpreting cultural realities

and emotional states. For example, the peculiarities of the southern dialect of the characters, reflecting their geographical affiliation and social status, are particularly difficult to translate.

Thus, the selection of these works covers all kinds of translation difficulties, which makes them excellent objects of research.

The rapid introduction of MT into human life highlights the relevance of research in this area. MT tools (such as Google Translate and DeepL) that provide instant translations into different languages still face difficulties in maintaining tone, contextual understanding, and cultural nuances. However, these aspects are very important for working with artistic and scientific materials (Smith, 2022). For the research in this study, two texts were selected as primary examples: To Kill a Mockingbird by Harper Lee and A Brief History of Time by Stephen Hawking, which are written in distinctly different styles – artistic and scientific. To Kill a Mockingbird features numerous figurative expressions, as well as cultural and emotional subtleties, which require careful interpretation and nuanced understanding from the translator. By contrast, A Brief History of Time uses technical words that need to be accurately translated and explained. By examining a variety of cases, this study seeks to show the advantages and disadvantages of machine translation and discover when machine translation fails, so that it can show where human translation is still necessary. In these works (Sennrich, R., Haddow, B., Birch, A., Green, S., Heer, J., Manning, C. D. and others), translators emphasize the accuracy of meanings and how to handle sensitive and emotional aspects.

For these reasons, this chapter will cover the theory and practice of research and will form the starting point for studying the translation of selected materials.

Machine translation (MT) systems rely on algorithms for instant translation, but they often fail to capture cultural subtleties, emotional depth, and figurative language. For example, works such as To Kill a Mockingbird depend heavily on feelings and cultural backgrounds which may be hard for MT to translate accurately. A translator carries out human translation by using their critical and analytical thinking, making sure the message and all the important details are conveyed in the target language.

Based on the analysis of the theoretical principles of the translation process, it can be concluded that MT is strong in the speed of processing simpler texts, whereas HT is an integral part of interpreting text taking into account emotions, context, etc. These features will be further explored using the examples of "To Kill a Mockingbird" and "A Brief History of Time".

As emphasized in the research by Koehn and Knowles (2017), machine translators are excellent at translating terminology, but they face problems interpreting the author's ideas. The

HT is able to transform the text in such a way that it will be accessible and understandable to the reader, while maintaining scientific authenticity.

Consequently, research shows that the translation of works of fiction by machine translators is limited, despite the prospects for translation from scientific materials. HT dominates MT due to its cognitive and creative abilities. He is able to retain style and emotional overtones, conveying the meaning of the source material to the target audience. These conclusions serve as the foundation for the subsequent analysis of the works in the context of this study, and also confirm the inherent nature of human translation.

Materials and methods. The clarity and accessibility of the translation are very important for "A Brief History of Time", since the author uses complex scientific concepts that the translator needs to convey not only correctly, but also in an accessible way to readers. Terminology is transmitted by machine translation quite effectively, but difficulties arise when processing complex scientific images and syntactic constructions. The study evaluates how well machine translation meets the criteria of consistency and correctness in the transmission of scientific ideas in comparison with the translation performed by a professional translator.

"To Kill a Mockingbird" is a literary classic in which historical and cultural realities are closely intertwined with the inner world of the characters. The saturation of the work with southern dialects and idioms makes it difficult to translate, since it is necessary to preserve not only the meaning, but also the originality of the original. In this regard, the research is aimed at analyzing ways of transmitting cultural and emotional content in human translation in comparison with machine translation, which is often limited to verbatim and template text processing.

In addition, the work focuses on identifying genre characteristics that may affect the accuracy and expressiveness of the translation. A comparative analysis of scientific fragments with terminology in "A Brief History of Time" and dialogues and cultural realities in "To Kill a Mockingbird" will make it possible to identify when the MT copes with the task and is sufficient, and when the participation of a professional translator is necessary.

Qualitative and comparative analysis of human and machine translation forms the basis of the research, allowing us to determine the impact of translation models on the conveyed idea, manner of presentation and cultural context. The need for a deep assessment of the contextual and emotional nuances of translation led to the use of qualitative analysis.

Translation analysis allows you to compare the strategies used by humans and automated systems. Human translation, unlike machine translation, allows you to preserve the emotional expressiveness and cultural content of the text. Machine translation, as a rule,

remains within the framework of verbatim, which plays a special role in the analysis of "To Kill a Mockingbird", since emotions and cultural context have a significant impact on the perception of the work.

Conducting an expert assessment will ensure the identification of cases in which the MP fails to preserve the author's meaning and handwriting, which is especially important for preserving the cultural context and emotional depth of "To Kill a Mockingbird" and the correctness of scientific formulations in "A Brief History of Time".

The combined approach, including comparative, content, and expert analysis, provides a detailed translation analysis. The content analysis method allows us to examine the text from the point of view of stylistics and cultural realities, comparative analysis reveals the features and differences of approaches to translation, and expert analysis helps to determine the level of translation quality taking into account professional standards.

Result and discussions. The research findings will be presented systematically through this chapter according to the established methodology mentioned in the preceding chapter. The main purpose of this investigation involves a comparative analysis between human translators and machines using passages from Harper Lee's “To Kill a Mockingbird” and Stephen Hawking's “A Brief History of Time”. This research assesses the accuracy level alongside stylistic variations and cultural content changes by conducting English back-translation from Russian language texts with Google Translate and DeepL and comparing them against the original English versions.

Comparative Analysis of the Translation of «To Kill a Mockingbird»

The following section evaluates human versus machine translation through selective analysis of Harper Lee's To Kill a Mockingbird publication. The current study evaluates translation discrepancies found in literary texts between their original language and adopted Russian version.

Excerpt 1: Jem’s Injury Description

Original English Text:

"When he was nearly thirteen, my brother Jem got his arm badly broken at the elbow. When it healed, and Jem’s fears of never being able to play football were assuaged, he was seldom self-conscious about his injury. His left arm was somewhat shorter than his right; when he stood or walked, the back of his hand was at right angles to his body, his thumb parallel to his thigh. He couldn’t have cared less, so long as he could pass and punt."

Original Russian Text:

"Незадолго до того, как моему брату Джиму исполнилось тринадцать, у него была сломана рука. Когда рука зажила и Джим перестал бояться, что не сможет играть в футбол, он её почти не стеснялся. Левая рука стала немного короче правой; когда Джим стоял или ходил, ладонь была повернута к боку ребром. Но ему это было всё равно – лишь бы не мешало бегать и гонять мяч."

Machine translated from Russian:

"Shortly before my brother Jim turned thirteen, his arm was broken. When his arm healed and Jim stopped being afraid that he would not be able to play football, he was almost not shy about it. His left arm was slightly shorter than his right; when Jim was standing or walking, his palm was turned sideways. But it didn't matter to him, as long as it didn't interfere with running and kicking the ball."

Analysis:

The machine translation introduces several distortions. Firstly, the phrase "He couldn't have cared less, so long as he could pass and punt." was altered to. «Но ему это было всё равно – лишь бы не мешало бегать и гонять мяч»- "But it didn't matter to him, as long as it didn't interfere with running and kicking the ball." The machine translation loses the football-specific terms "pass and punt," which are essential to understanding Jem's passion for the sport. Additionally, the anatomical description of his injury is inaccurately translated; "the back of his hand was at right angles to his body, his thumb parallel to his thigh." becomes "his palm was turned sideways," which alters the original meaning.

Excerpt 2: Jem and Dill's Argument

Original English Text:

"Jem thought about it for three days. I suppose he loved honor more than his head, for Dill wore him down easily: "You're scared," Dill said, the first day. "Ain't scared, just respectful," Jem said. The next day Dill said, "You're too scared even to put your big toe in the front yard."

Original Russian Text:

"Джим думал три дня. Наверное, честь ему была дороже жизни, потому что Дилл его донял очень легко.

— Ты трусишь, – сказал он в первый же день.

— Не трушу, просто невежливо ломиться в чужой дом.

На следующий день Дилл сказал:

— Ты трусишь, тебе к ним во двор одной ногой и то не ступить."

Machine translated from Russian:

"Jim thought for three days. Honor was probably more important to him than life, because Dill hired him very easily. 'You're a coward,' he said on the first day. 'I'm not kidding, it's just rude to break into someone else's house.' For tomorrow, Dill said: 'You're scared, you can't even set foot in their yard.' "

Analysis:

The machine translation distorts the meaning of "Dill wore him down easily," translating it as "Dill hired him very easily," which changes the entire context of the scene. The informal dialogue, particularly the phrase "Ain't scared, just respectful," is also misinterpreted. Instead of retaining the casual, Southern dialect of Jem's speech, the machine translation reformulates it in a more neutral tone. The phrase "You're too scared even to put your big toe in the front yard." is also altered in meaning, as the nuance of teasing and exaggeration present in the original text is lost.

Machine translation fails to protect the multi-dimensional characteristics and stylistic complexity which literary works contain according to the analysis of selected excerpts. The transmission of main concepts occurs reliably in machine translation yet fundamental aspects including slang usage and cultural elements and informal speech patterns become garbled or vanish entirely. Machine translation demonstrates its bad performance in literary texts because it loses essential football jargon and fails to understand Southern accents in addition to blurring emotional depth during Sendoff.

Machine translation uses mainly statistical and pattern-based methods for its translations while human translators prioritize context and tone and cultural elements thus causing significant meaning and style errors. The research verified that human translation performs better than machine translation when processing literary content because it maintains both artistic elements and cultural integrity of original works.

The analysis of human and machine translation methods relies on excerpts from Harper Lee's novel 'To Kill a Mockingbird.' The table demonstrates their translation performance. The evaluation concentrates on significant linguistic values in combination with stylistic features that assess accuracy together with style preservation alongside idiomatic expressions and cultural context as well as emotional depth of writing and sentence comprehension and context maintenance. The evaluation demonstrates major distinctions between human translators and machine translation systems especially as they work on handling literary texts. The research shows human translators surpass machine translators in their ability to protect intellectual style and traditional phrases and emotional character. The procedure of machine translation delivers essential message comprehension although it frequently drops important elements of

Southern dialect, informal speech, and cultural references. The translation process of both figurative language and idioms results in literal interpretations because these phrases lose their meaning when rendered directly. When applied to dialogues the lack of authentic conversational style combined with natural communication patterns makes dialogue lines less genuine to the original characters. The artificial translation process has difficulties creating coherent sentences because it produces correct grammar but rigid and unnatural wording. Emotional excerpts demonstrate better execution through human translators who decode moods and purposes that machine translation makes harder to perceive. Machine translation has a basic incapability to recognize underlying meaning which results in incorrect literary reading interpretation because of poor contextual understanding. The investigation supports that human translation performs better than machines for literary works because it maintains cultural modifiers with both literary style and emotional nuances. The basic utility of machine translation for understanding text exists but it fails to reach the deep profound level needed to communicate the sophisticated content found in To Kill a Mockingbird.

Comparative Analysis of Human and Machine Translation in A Brief History of Time

The research compares between human translators and computers when processing excerpts from Stephen Hawking's book A Brief History of Time. The purpose of this analysis examines the ability of machine translation to maintain scientific precision as well as both style and cultural elements when measured against human translation.

Excerpt 1: The Nature of the Universe

Original Russian Translation (Human-Translated)

"Мы живем в странной и замечательной Вселенной. Неординарное воображение требуется, чтобы оценить возраст ее, размеры, неистовство и даже красоту. Место, занимаемое людьми в этом безграничном космосе, может показаться ничтожным. И все же мы пытаемся понять, как устроен весь этот мир и как мы, люди, смотримся в нем."

Original English Version (Stephen Hawking)

"We live in a strange and remarkable universe. It takes an extraordinary imagination to appreciate its age, size, violence, and even beauty. The place that humans occupy in this boundless cosmos may seem insignificant. Yet, we strive to understand how the entire universe works and how we, as humans, fit into it."

Machine-Translated English (Back-Translation from Russian)

"We live in a strange and wonderful Universe. Extraordinary imagination is required to appreciate its age, size, fury, and even beauty. The place occupied by humans in this boundless

cosmos may seem insignificant. And yet, we try to understand how this whole world is structured and how we, as humans, fit into it."

Looking at the Disparities in Translation

1. The use of scientific names and descriptions:

When translating, the human translator sees to it that words such as violence are always rendered the same as they appear in the original English, here "неистовство".

Even so, “violence” is changed in the machine translation to “fury”, though the meaning is similar and does not specifically refer to cosmic supernovae or black hole collisions.

2. Stylistic Fidelity:

The original text was engaging and poetic which can still be found in the human translation.

Using a machine translation gives text that is grammatically correct but feels less fluid and natural. The phrase "how the entire universe works" is a better way to say "how this whole world is structured" than we have in the song.

3. Arranging for the use of Idiomatic Expressions and Nuances.

The unique idea originates across straight and deprived of any misleading language.

While machine translation works, it sometimes misses the beauty of literary phrases, like in this case where "Extraordinary imagination is required" were used rather than "It takes an extraordinary imagination." It sounds more natural in English to use the latter construction.Excerpt 2: The Infinite Regress Problem (Turtles All the Way Down)

Original Russian Translation (Human-Translated)

"Однажды ученый выступал с публичной лекцией по астрономии. Он рассказывал, как Земля вращается вокруг Солнца, а Солнце, в свою очередь, обращается вокруг центра огромного скопления звезд, называемого нашей галактикой. В конце лекции пожилая дама встала и сказала: «Вы все говорите ерунду. Мир — это плоский диск, стоящий на спине гигантской черепахи». Ученый улыбнулся и спросил: «А на чем стоит черепаха?» На что женщина ответила: «Вы очень умный молодой человек, но это черепахи до самого низа!»"

Original English Version (Stephen Hawking)

"A well-known scientist (some say it was Bertrand Russell) once gave a public lecture on astronomy. He described how the Earth orbits around the Sun and how the Sun, in turn, orbits around the center of a vast collection of stars called our galaxy. At the end of the lecture, a little old lady at the back of the room got up and said: 'What you have told us is rubbish. The world is really a flat plate supported on the back of a giant tortoise.' The scientist gave a

superior smile before replying, 'What is the tortoise standing on?' 'You're very clever, young man, very clever,' said the old lady. 'But it's turtles all the way down!'"

Machine-Translated English (Back-Translation from Russian)

"Once a scientist gave a public lecture on astronomy. He talked about how the Earth revolves around the Sun, and the Sun, in turn, revolves around the center of a huge cluster of stars called our galaxy. At the end of the lecture, an elderly lady stood up and said: 'Everything you say is nonsense. The world is a flat disc standing on the back of a giant turtle.' The scientist smiled and asked: 'What is the turtle standing on?' To which the woman replied: 'You are a very smart young man, but these are turtles all the way down!'"

Analysis of Translation Differences

1. Loss of Cultural and Literary Elements:

o The phrase "turtles all the way down" is an important philosophical and humorous metaphor.

o The human translation successfully conveys this phrase while keeping the humor and meaning intact.

o The machine translation retains the phrase but introduces unnecessary grammatical errors, such as "these are turtles all the way down!" instead of "it's turtles all the way down!"

2. Grammar and Naturalness:

o The human translation maintains fluidity and natural sentence structure.

o The machine translation produces minor grammatical errors, such as "these are turtles all the way down!", which disrupts the readability.

An evaluation between human translators and machine translation in A Brief History of Time demonstrates that machines struggle to properly process scientific and literary language content. Machine translation effectively communicates the basic text message but fails to understand specialized terms and cannot properly handle artistic congregations and cultural related descriptions.

The evaluation of scientific text showed an improved performance from machine translation systems though they demonstrated various translation shortcomings. The translation of key terms in A Brief History of Time experienced occasional errors while metaphors used by Hawking to explain complex physical concepts became confusing and less effective. Human translators remain essential for scientific communication because they can guarantee precision alongside clarity in all scientific material. This research strongly validates

the hypothesis that human translation excels at literary works because it conducted an analysis of translation methods.

The translation of scientific principles demands complete precision because it affects how readers understand the information. The accurate translation of "violence" in cosmic events resulted in "fury" which altered the original meaning of the description. The machine translation failed to properly reproduce literary and humorous elements at the same level of effectiveness so the results contained awkward phrasing which diminished these important aspects of the text.

Machine translation displays significant progress when processing formatted and forthright texts yet these systems are not effective in translating intricate literature that needs full contextual analysis and cultural alterations. People who directly interpret books need to exist because their skills protect both technical accuracy and literary elegance together with cultural nuances to make their labor indispensable in translating A Brief History of Time.

- Machine translation provides general accuracy but often misses tone, nuance, and fluidity, especially in scientific or philosophical contexts.
- Human translation not only delivers accurate meaning but also adapts expressions to fit the natural rhythm of Russian academic or popular-scientific writing.

The experimental results match previously studied patterns in machine translation domains. Koehn & Knowles (2017) demonstrate that contemporary neural networks excel at structured texts however these systems remain inadequate when processing literary style alongside contextual adjustments. According to Toral & Way (2018) machine translation systems are incapable of effective metaphor and idiomatic expression adaptation so the text loses its meaning and expressive quality. Research findings support this conclusion because Hawking's and Lee's texts showed neural networks reducing elaborate sentences and eliminating cultural variety and modifying the literary writing quality. The experimental outcomes confirm our research findings because machine translation systems perform inadequately when it comes to maintaining cultural depth in texts. The competitive performance of machine translation requires various improvements to occur. Training methods for literary texts need enhancement to improve adaptability of idioms and preservation of style and natural dialogue quality. The development of translation models works with extended text selection rather than working with individual sentences. A hybrid option that allows human editors to improve machine-generated draft translations constitutes the system.

Conclusion and recommendation. Throughout the course of this research, a detailed examination of the superiority of human translation over machine translation has been carried out. The study aimed to reveal the key factors that make human translators indispensable, especially in contexts where cultural sensitivity, emotional resonance, and stylistic integrity are crucial. By comparing the translation of two significantly different texts — the literary work To Kill a Mockingbird by Harper Lee and the scientific text A Brief History of Time by Stephen Hawking — it became evident that although machine translation systems have achieved remarkable progress, they still fall short in several critical areas that require human intuition, creativity, and deep contextual understanding.

Based on the analysis of literary translations, machines are not yet able to transmit the details of emotions, cultural elements and common expressions that people use when communicating in fiction works. Often, machines change the way the text is meant to be understood and reduce the emotional impact the author wanted to create. In contrast, human translators use their deep knowledge and understanding of language and culture to keep the tone, mood and major ideas from the original. They make use of creative language, maintain the important features of the original language and make sure the spirit of the gave remains alive in the new translation.

Machine translation systems such as Google Translate and DeepL can improve sentences and keep the grammar correct, but they are, nonetheless, still likely to make errors with tricky sentence structures, metaphors or unique expressions used in explaining tough scientific ideas for a general audience. Here, the extra benefit of having human translators is in making sure the meaning is clear, the information is easy to grasp and the essential ideas are not altered. It was also discovered in the study that human translation is a mental process that goes beyond words by needing to understand, adapt to and express both cultural and emotional aspects of text. A human translator helps bring together cultures and make sure that the content is accurate and feels appropriate to the readers in another country.

The research shows that human translators are needed where the finer points, appealing style and deep grasp of the content are crucial. Even though AI enhances the translation process, especially by making both easy and quick, its strengths cannot yet replace the specifics and attention that a human translator brings to complex and imaginative scenarios. Instead of replacing humans with machines, the future improves translation by merging the advantages of machines with those of experienced translators. Working together could increase both the accuracy and the emotional touch in translations, mainly in important domains.

To sum up, no matter how fast machine translation progresses, people still rely on human translators. The way they maintain the original meaning, style and culture in texts saves the richness of how we express ourselves through language. As technology gets better, human experts and artificial intelligence can bring new standards to translation, but real quality and thoughtfulness in translations always rely on the human touch.

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