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Штучний інтелект у перекладі: можливості та виклики для професійних перекладачів у цифрову епоху / Artificial Intelligence in Translation: Opportunities and Challenges for Professional Translators in the Digital Age

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Анотація

Зацерковний О.Р. Штучний інтелект у перекладі: можливості та виклики для професійних перекладачів у цифрову епоху - Кваліфікаційна робота за освітнім ступенем «магістр». – Західноукраїнський Національний Університет – Тернопіль, 2025.

Магістерська робота присвячена дослідженню можливостей штучного інтелекту у перекладацькій діяльності та наявність викликів і труднощів, що пов’язані з функціональним потенціалом наявних засобів перекладу.

У роботі розглянуто аспекти встановлення домінантної ролі штучного інтелекту у перекладацькій сфері, його стрімкий розвиток та вплив на культуру, моральні та технічні фактори впровадження відповідних технологій та подальше прогнозоване майбутнє їх застосування. Відстежено тенденції розвитку штучного інтелекту за рахунок аналізу відкритих джерел, наукових доробок провідних експертів та власного досвіду.

Результатом проведених в роботі досліджень є закономірне та статистичне підтвердження зростаючої популярності штучного інтелекту та його розповсюдження у всіх сферах життя, що дає змогу спрогнозувати майбутній стан речей у суспільстві що керується алгоритмами.

Ключові слова: штучний інтелект, переклад, інтерпретація, культурний вплив, етичність впровадження, робочий потенціал, розвиток технологій

Abstract

Zatserkovnyi O.R. Artificial intelligence in translation: opportunities and challenges for professional translators in the digital age - Qualification work for the educational degree ‘Master’. - West Ukrainian National University - Ternopil, 2025.

This Master's thesis is devoted to researching the possibilities of artificial intelligence in translation and the challenges and difficulties associated with the functional potential of existing translation tools.

The thesis examines aspects of establishing the dominant role of artificial intelligence in the field of translation, its rapid development and impact on culture,

moral and technical factors in the implementation of relevant technologies, and the predicted future of their application. Trends in the development of artificial intelligence are tracked through the analysis of open sources, scientific works by leading experts, and personal experience.

The result of the research conducted in the paper is a logical and statistical confirmation of the growing popularity of artificial intelligence and its spread in all spheres of life, which makes it possible to predict the future state of affairs in a society governed by algorithms.

Keywords: artificial intelligence, translation, interpretation, cultural influence, ethical implementation, working potential, technology development

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Introduction

The research and investigation of AI's activity is one of the most important topics in modern society – it allows people to understand the scale of computerization and automation present in our world and what benefits and challenges it brings. The author of this paper strives to find evidence of the importance of artificial intelligence in the field of translation and interpretation specifically and in global environment generally.

The aim of research is to determine the scale of artificial intelligence's involvement in the sphere of translation and interpretation and to anticipate the way current trends escalate under the influence of technological development of societal diversification. The top priority for scientific work is to compare the studies of artificial intelligence of the past, and the tendencies present nowadays which will effectively be transformed into the foundation for descriptive analysis of AI's predicted development in the future.

The objective of the research is the deep and structured analysis of current aspects of artificial intelligence usage in translation and interpretation field and, as a result, formation of scenarios of its development and prospective impact on digitalization and automation in chosen field.

The object of the research is the translation field itself, and the processes conducted within it in the age of automatization and digitalization. The object also covers the modern translation technologies in demand and how artificial intelligence influences linguistics as a whole.

The main subject of the research is the impact of modern translation and interpretation technologies on the overall activity specialists from the respective field, along with the change artificial intelligence brings to the quality, relevancy and functionality of conveyed translations and interpretations. Moreover, the paper focuses on long-lasting curvature of changes and challenges that translators have either already encountered or will face in near future.

The methodology of the research is the analysis of actual cases of AI technology implementation in diverse spheres of society's existence and functioning as well as the experience of the past usages of such technologies and anticipation of the potential of artificial intelligence development in the future,

The continuous development of human society is a never-ending path of evolution, discoveries, inventions and, even more importantly, losses and insurmountable challenges that our race faces constantly. It is by no means an overexaggeration that problems and approaches that people find to overcome them are specifically what moves humanity forward. It applies to every fraction of our being and to every sphere and field we connect our lives with. Our world would be a different place without cultural and political conflicts, wars and disputes over territory, power, influence, money, and freedom. Freedom is the abstract concept that was self-inflicted on us by our predecessors who strived for the ability to be able to make their own decisions and express their own self-constructed thoughts that reflected their own vision of the world. As it appears, last sentence describes explicitly the form of freedom that allows humans to communicate as well – speech, language, and choice of words.

It is safe to say that the society we have built so far exists solely because humans are able to exchange their ideas and flow of thoughts among one another, turning it into agreements and plans for future. Things taken altogether, humanity's capability to communicate allowed us to make certain amount of progress and put ourselves on the top of this world with all rivals being left behind thanks to our overwhelming intelligence. Humanity subdued all the species inhabiting this world and now single-handedly controls the way it develops and changes. And communication is the key factor of this success and is to be considered the key reason the world looks how we see it now.

However, communication, as the process of information and ideas exchange between different subjects, has evolved and changed dramatically, constantly covering humans' needs and transforming in order to allow people to exchange information more effectively and quickly. If we compare the society of today and the

one people lived few thousand and even hundred years ago, we can notice a drastic change in the density, productivity, and velocity of communication processes. A few thousand years ago communication was limited in territory of coverage, the number of recipients and size of delivered messages, since everything was conducted manually with the heavy reliance on human strength, power, and intelligence. Our generation receives the flow of information so grand that it exceeds the one of all our predecessors combined.

Obviously, such saturation of our brains with information has both positive and negative sides. On one hand, access to data all around the world is transparent and every person around the globe has the ability to develop significantly in erudition and general knowledge. On the other hand, the information we consume is not always guaranteed to be either helpful or educational, which leads to the question of the necessity of production of content, the value of which is to cover solely the needs of entertainment. The beforementioned problem gains severe relevancy in the 21st century, especially in 2025 when content produced by artificial intelligence is currently overthrowing the one made by people and, at the same time, brings no purpose whatsoever. One may argue that it simplifies numerous actions, but what must truly be considered is the number of people who suffer from unemployment and decreases in demand in those sectors where humans cannot compete with AI in how quickly and effortlessly it manufactures the product.

Translation and interpretation are among the fields where the danger of AI supremacy exists and thrives. And while AI still requires human editing and clarification to be able to produce high-quality translation, author believes the time when computers become self-sustaining and efficient enough to function without outer assistance is approaching. Translation is an endangered specialty which requires reformation for it not to be overwhelmed by AI but to adapt and use it safely, which will allow people to enter new age of productivity and prosperity. And this is where lies the goal of this paper to research the tendencies of today’s AI progression and discover future prospects of its use.

CHAPTER 1. THE ROLE OF ARTIFICIAL INTELLIGENCE IN HUMAN SOCIETY. THE HISTORY OF DEVELOPMENT, PROGRESS AND THE SCALE OF ITS INVOLVEMENT IN WORLD'S LIFE

1.1. The History of Translation as a Foundation of Intercultural Communication

History of the art of interpretation and translation is vast and diverse, filled with creative ways of constructing the bridge for communication between different people, nations, and ethnicities. The need for proper ideas exchange and conversation structuring arose when numerous civilizations around the world started to grow exponentially, claim territories, and establish their legacy. The interaction between such developed society was inevitable and such inevitability created the space for the emergence of mediators – people who thanks to their linguistic abilities of possessing the superior knowledge of two or more languages made it possible for opposing sides to refrain from unnecessary conflicts and devastating casualties and loses. The first documented proof of the existence of translators goes approximately five thousand years back in time to Ancient Egypt were trade and official relations with neighboring countries revolved around bilingual speakers. The role of translators in Ancient Egypt was immense as their actions allowed state-scale resources exchange and assured the prosperity and abundance for the entire nation.

Apart from Egypt, other states of Middle East and Asia, such as Babylon, India, Persia and Assyria were then centers of scientific life and, as a result, places of gathering for a stunning number of representatives from different countries and cultures.

Sumerian, for example, are responsible for the first ever documented and written translations like Epic of Gilgamesh which is to be considered one of the most influential pieces of writing ever made that still troubles the minds of scientists and translators thousands of years after.

Baghdad was arguably the most prominent city of the Old Age, with a population far exceeding most contemporary rivals and even cities of today, where language and trade were tightly connected and interdependent.

Babylon was the center of technological development with a heavy emphasis and incline on scientific development and embracing the capabilities of human mind. Babylonian civilization is amongst the most influential state entities in the world that impacted the whole region with its customs, traditions and scientific approach specifically towards mathematics and astronomy. Their focus on science led to the development of a revolutionary base-60 number system, the invention of a precise calendar, advanced astronomical prediction techniques and implementation of the first bilingual trade agreements with neighboring states.

Translation in Europe was mainly concentrated in The Roman Empire – arguably the most influential state-owned unit to ever exist – where numerous researchers and enthusiasts dedicated their lives to not just obtain the skill of translation from their Asian predecessors but to master it and push to a new level. One of the most important figures in this part of Roman ancestry is Livius Andronicus, who translated Homer's the Iliad and the Odyssey from Greek into Latin, thus promoting the value of Latin language and separating it from Greek. And while Livius' achievement may be more relevant for cultural needs and establishment, there were others who significantly boosted linguistic part of translation in Europe. Some of them were Marcus Tullius Cicero, who introduced the concept of "theory of translation" and described the importance of conveying not just words but senses and meanings into translation. His ideas lie in the basic principles of modern translation techniques, identifying how even two thousand years ago people understood the difference between hectic changing of words and thorough search for meaning. Moreover, figures like Horace, Apuleius and others, the idealistic followers of beforementioned expert, continued and complemented his ideas by not just allowing themselves to alter the structure in favour of meaning, but to change the meaning itself as well. Their translations are filled with replications, replacements, structural changes, and omissions. The goal of it was to transform the translation from strict conversion of words between languages into a form of art. And even though such violations of original texts cannot be comprehensibly accessible while working with materials of higher importance, this trend set a mark for future

generations of translators and interpreters on how the meaning and context stands about fixed norms. **[43]**

The Middle Ages are considered the epoch of stagnation and destruction. Countless wars, pandemics, and overall illiteracy swarmed the land, especially Europe. However, even in such unfavourable conditions, international communication strived in different forms. Horrific wars and the increasing number of participants in them became a catalysis for generals and kings to embrace talks over fights. Managing international conflicts became impossible between people who knew how to speak multiple languages on site. Again, the most valuable translator and interpreters were those who could not only delivered the message but to make it most acceptable and profitable for both sides. At the same time, the end of Middle Ages marked transition towards more pragmatic approach to translation. While religion exerted its dominance over entire continents, the need for strict and specific translations, without abundant creativity, arose rapidly. Scholars in Spain, Germany and England openly protested "sense-to-sense" translation claiming it to be disrespectful towards the target language. Furthermore, the general trend towards thorough and cautious analysis of both source and target language appeared. **[43]**

After the Middle Ages came the Renaissance and, along with it, the invention of movable-type printed press was introduced to the world by a German inventor Johannes Gutenberg. Even though written translation has already existed in the world for hundreds of years, Gutenberg's creation revolutionized how language was perceived:

- It allowed for a faster spread of information, proper relevancy of delivered facts and statements.
- It increased the potential of writing down and replicating scientific works, dictionaries and novels of any kind.
- It made it possible for a far greater number of people to gain access to previously unreachable knowledge.

- It reshaped the way translation was conducted and organized by making it easier for professional translators to analyze, collect and navigate information. **[45]**

The Renaissance was a period of true rebirth for many of the societal sectors as both culture and science regained its importance in the eyes of not only nations' leaders but also common people. Religious aspect was still crucial, and its' influence is confirmed by how focused translators were on religious manuscripts and testaments. Among the key milestones of not just Renaissance period of translation, but the whole history of this sphere is the William Tyndale's translation of Bible into English from Latin. Experts agree that William Tyndale did not just give England the Bible but also reintroduced English language to the world scene, actively reforming and reshaping its role in Europe of that time. **[13, 43]**

The period of 17th - 19th centuries is signified by the evolution of European translation theory, once again, from free translation to a more balanced option, where sense and structure coexist.

Yet, during the periods of Classicism and the Enlightenment, translators worked to keep the texts composed and artistic, so that the style prevailed over context.

By the late 18th and 19th centuries, during the Romantic era, the principles of faithful artistic translation began to dominate. The overall trend to combine actual context and literal prowess was well-established and pursued by most scholars. Such changed perspective carved the path for modern translation techniques where cultural authenticity and original structure are highly valued. People's demand for translation was increasing gradually. At the same time, the overall trend of presenting translation and interpretation as actual and functional professions, for which proper analysis and preparation were essential, grew exponentially. The need for theory of translation became obvious and numerous scholars attempted forming it. The world stepped into a new age of globalization and translation was on a brink of massive changes. **[42]**

1.2. Globalization and How It Increased Demand for Fast and Precise Translation

The cultural and technological shift of the twenty-first century, when the world became more interconnected by information and interactions than it ever was, is called globalization. The appearance of the term globalizations is a result of human society becoming more transparent – countries opened borders to one another and people started moving freely among countries. While such trajectory of "open world" favoured specific economies and allowed people to bring about their culture to new places and broaden their understanding of the world they lived in, it also caused unreversible changes in the way people communicated with one another and brought increasing demand to international and even transcontinental means of communication and corresponding.

As many changes in the human history previously, globalization was caused by war and international conflicts. After the horrors of both World Wars, economies of most countries relied on trade and international agreements. While some countries focused on rebuilding their societies and reestablishing the order they once had, others, that suffered less, used this opportunity to exert dominance on international market and get the maximum profit from the cooperation with other nations. Countries like the United States of America and Australia were increasing their international relations by allowing European countries to trade with them through lower tariffs, while some nations of Asia, like China, were seizing their opportunity to rapidly increase the number of international relationships they had. European countries, on the other hand, factually lost their dominance and relied solely on the outside support which made them vulnerable and overly connected to trades and agreements with rising prospects from outside their continent. **[27]**

Globalizations also introduced massive changes to cultural life. While most of human history, from cultural perspective, can be described as "rich but isolated development of significant yet preserved cultures," the course of events in the 20th century changed it into "international cultural revelations and mingling". Cultures around the world, even the most secretive and isolated ones, were no longer developing in their own pace – they were now all parts of a whole mechanisms where

they needed to adapt, change and mix with others, more influential ones. The clearest examples of cultural dominance are modern US and Japan, whose cultural impact has already been visible for decades with their trends being trends for the entire world. Going back to the beginnings of globalization, culture was spreading through the means of communication that were developing accordingly. Post, telegraph and radio allowed people to communicate over long distances without direct contact, enabling transferring of information in never-before-seen quantities. **[16]**

Naturally, it affected translation as well. All the information transmission during World War II would not have been possible without translation. Allies exchanges valuable information via radio, and The Axis used their scripts and secretive methods to communicate their own strategy. Even the establishment of the infamous Enigma would be impossible without proper communication of expert from different countries and cultures. Considering the amount of different people who cooperated on both sides during the events of World Wars it can stated that the world we see today exists solely because people managed to collaborate and, more essentially, communicate thanks to the advanced methods of translation and, later, interpretation.

Post-war trade is another sphere where translation techniques were used for establishing international relations. With the rapid development of means of transportation, communication and technological output, people found it necessary to convert their ideas into practise outside their natural habitat. Workers and scientist from Europe were travelling around the world to use their knowledge while Asia and North America welcomed and insisted on sheltering countless experts that were looking for better life escaping from countries ravaged by war. Translation become immensely important not just for countries that tried to spread influence over entire continents but for people who struggled to settle in environment that was new for them and were looking for communication as the most common way of adaptation. **[46]**

Looking from the professional and materialistic perspective, globalization influenced businesses and companies across the globe to the point that the largest of

them were moving across borders to open new departments and branches to conquer new markets and get more potential customers to be more familiar with their products. New markets opened new challenges that involved finding labour and people willing to cooperate. At the same time, cooperation is impossible without clear understanding of the ideas expressed by both sides. Therefore, translators, mediators and interpreters became vital once again. However, this time, they were forced to travel around the globe to help people in different corners of the world to reach agreement. **[28, p.45-67]**

Technological development of the 20th century is marked as the most rapid increase in the overall quality of life in history of humankind when digital technologies and automation swarmed all spheres of humans' lives. Prior to digitalization was industrialization which led to increased factory output and mass-production of products. However, it cannot be compared to digitalization that changed not just industry but the entirety of how people saw the world. Digitalization, on its own, began with the usage of algorithms and machine learning as an essential part of most complicated processes previously performed by humans.

1.3. Evolution of Machine Translation Technologies

The first machine translation systems emerged in the 1950s, inspired by both linguistic structuralism and early computational advances. These rule-based machine translation systems relied on manually created grammatical rules, bilingual dictionaries, and morphological analysers while their functioning was grounded in the belief that language could be modelled as a set of explicit, formalized grammatical operations and that the processes of its' transformation can be conducted without human interference.

However, rule-based machine translation required extensive linguistic expertise and enormous human effort to create and maintain rule sets for each language pair. Moreover, the systems struggled with ambiguity, idiomatic expressions, and contextual meaning. From today's perspective we can say that such trends led to the largest shift in how information was overseen throughout history, but, at the time, it appeared as a hectic way of relying on machine to cover people's needs.

A significant shift occurred in the early 1990s with the rise of statistical machine translation. Instead of relying on handcrafted rules, it used probability models derived from large databases that involved the usage and remembrance of patterns and most widely used phrases and expressions to provide the best, statistically approved and verified result. Many could argue it eliminated the entire sense of translation as the form of creativity and combining pure communication and exchange of information with cultural nuances and vision of different sides. Nonetheless, in society where now every process was happening at fast pace, there was no space for extravaganza.

Statistical machine learning significantly improved the naturalness and fluency of machine-generated texts. The most popular formula within the market was phrase-based translation which analysed the given text and reformed it based on the most typical phrases used in such context. In fact, it took the piece of information and, judging by its own classification, predetermined what could have been expressed in the message considering hundreds of thousands similar messages it received prior to the one it was working with now. Such approach brought numerous challenges and provoked criticism towards machine translation as the one that eliminates the uniqueness and makes mistakes by changing the essence of the abstract given. **[11]**

The sphere strived for a groundbreaking innovation, and it received one - the introduction of neural machine translation was the one that changed translation forever. Unlike their predecessors that analysed separate words or phrases to conduct translation, neural machine translation systems operated with entire sentences and even their sequences, enabling the preservation of context and avoidance of mistakes that led to the lack of connection between ideas and overall coherence of senses. The architecture of neural machine translation systems allowed the text to remain full of meaning after going through the transformation from source language into a target language. Due to that, such systems emerged and quickly established themselves to be superior to statistical machine translation. The most prominent example of the service that uses similar neural machine translation mechanisms is DeepL Translator,

the quality and precise translation of which, especially considering contextual basis, is beyond compare among the services available for public use.

The newest stage of translation is Large Language Models which are the combination of traditional translation mechanisms with the creation of artificial intelligence that possesses the ability of cognitive analysis and ideas transformation. Such models can mimic the tone, structure and stylistic features of human speech and effectively use them to convey translations. In fact, they are true amalgamations of what humanity has achieved throughout its entire history, shrunk into one algorithm-based mechanism that conducts ideas with the same effectiveness and far superior speed than human brain. **[9]**

However, even though LLMs are revolutionary in terms of automizing translation processes, they still need human control and editing since occasionally their algorithms confuse themselves with their own patterns due to their immense abundance. Such problem can be avoided by the interference of human specialists who edit and naturalize the texts and translations provided by translation machines or artificial intelligence. Nevertheless, consecutive need for translation checking and proof-reading eliminates the entirety of the need of translation machines whatsoever. Humans and machines' cooperation remain essential for achieving the most precise and promising result. **[39]**

Overall, the evolution of machine translation technologies all the way from rule-based systems to large language models illustrates a never-stopping movement of linguistic adaptation and progress in the context of technological supremacy. Translation undergone the changes that marked the transition from humans-only sphere to a total machine dominance. And, witnessing the sheer pace with which modern translation methods are developing, the tendencies for future are bright and faded at the same time. On one hand, translation can soon become fully automized with the impact of humans being diminished completely. On the other hand, the lack of emotional aspect in translation and over-reliance on algorithms can be the sole factor that destroys humans' communication as whole.

1.4. The Emergence of Artificial Intelligence and Its Role in Language Technologies

Artificial Intelligence has undoubtedly conquered the entirety of world's professional and entertainment spheres. Most content produced by the users of social media, business corporations and international companies is influenced by artificial intelligence in one way or another. Society has already let and welcomed artificial intelligence and its' systems into many aspects of our lives – financial operations, healthcare and education systems, climate control, insurance policies, trade, and travel. The list can be prolonged to whatever quantity it takes since nowadays everything is being overfilled with AI-based technologies. The overall usage of artificial intelligence systems can have positive effects on how humanity perceives the world since our understanding of the environmental processes around us and our place in the world can benefit from using such technology in the way of allowing humans concentrate on essential breakthroughs instead of wasting time on mundane tasks. Human society can flourish culturally and scientifically by allowing AI to simplify the processes that take a lot of time and simplify their essence. Moreover, artificial intelligence systems can introduce new perspectives on how to deal with the ever-consistent problems like epidemics, climate change, human race development and so on. **[12, p.254-280]**

At the same time, artificial intelligence can cause irreversible harm to human societal structure. The main occurring problem is a before-mentioned over-reliance on such machines that take away the need to complete routine tasks. While, in theory, it should allow people to concentrate more on personal development and enrichment of mind and mentality, it can, with the same effectiveness and effortlessness decrease our cognitive abilities and brain functioning. And while it may seem like overexaggeration, the author believes it has already been influencing the way people live their lives mostly in negative way. **[34, p.107-122]**

First, we need to understand that the assessment of the impact of artificial intelligence technologies will be diverse, and it will differ significantly depending which region of the world or sphere of usage we take into consideration in the first place. For example, AI usage in Ukraine and its' educational institutions or cultural

life may seem insignificant at first. However, considering the current situation of active warfare in our country, it becomes clear that the potential of AI is not fully realised and, quite opposite, is mostly limited. At the same time, artificial intelligence and its' derivatives occupy a great portion of Ukrainian military technologies making them essential for this country's state defense and military operations. **[18, 20]**

Diverting from Ukraine to countries like Japan whose main focus shift from self-defense to cultural and economic development, we can notice the overall shift of artificial technologies use from practical to more entertaining or social aspects. Japan is one of the leading countries in terms of technological prowess and they mostly dictate and establish the trends we have in the modern world. According to International Trade Administration, Japan's artificial intelligence market is projected to triple from roughly $9 billion to $27 billion in 2029. This fact alone indicates the immense involvement of AI technologies in every sphere of Japan's economic life and also cooperation with other countries. Japanese trade, culture and lifestyle is currently spreading around the world with overwhelming success and AI is the crucial part of it. **[3, p.740-754]**

The example of Japan is important for understanding the overall situation with modern technology usage since this country, currently being the flagman for the entire world, indicated and significates the tendencies for other developed countries. Powers like Germany, the UK, Singapore, and Brazil active exploit and implement artificial intelligence in industry, manufacturing, and social life while the USA and China are well-known of having direct rivalries of introducing new and more powerful and developed AI technologies like ChatGPT and DeepSeek, respectively. Unsurprisingly, the above-mentioned systems are not close to what artificial intelligence is capable of right now. However, they represent the most common and popular services that people use in the world nowadays. For example, it is impossible to underestimate the impact the release of ChatGPT had not just on American citizens and allied countries but on the whole societies in distinct parts of the world. Entire education systems and quality-control services were forced to act and change accordingly solely due to the introduction of one bot.

All previously discussed topics underline the idea of the importance of artificial intelligence use in modern use with its proper control and limitations. Unless AI is effectively managed, it can cause more harm than profits to our world. It bears the power to reshape our societal ecosystems and humans have to understand how to withstand a potential strike. Returning to the benefits that AI can bring it is important to realize that the prospects of artificial intelligence use should not be considered only from the side of society as a whole. First of all, these technologies, just like every piece of technology overall, impact each individual personally. Only then do the impact and consequences gather together and retranslate themselves into the entire society. Therefore, we can separate the benefits AI brings into three distinct levels:

- Level of an individual (quality of individual's life; dealing with personal problems and struggles).
- Level of society (anticipating, avoiding, and tackling potential problems our society may encounter).
- Level of existence (using AI as a moral compass and guide for establishing cooperation and reconsidering the problems we currently have and might have in the future).

Talking about the possibilities of AI use for personal development is both exciting and frightening at the same time since artificial intelligence can both effectively boost the quality of individual's life by giving them more access to proper education, healthcare and entertainment attractions and also destroy their critical thinking skills and independence thus making them vulnerable and unable to react challenges and difficulties on their own. However, while the downside might be worrying, the overall benefits are difficult to ignore. In terms of personal development and linguistic prowess, artificial intelligence can become irreplaceable in the accessibility of language learning and international communication. While a few decades ago it was impossible to imagine going to a foreign country without proper knowledge of its' language since it would effectively make a person unable to communicate and express their desires, it has become a reality and norm nowadays. Today, special language converters like NoteGPT or ImTranslator allow people to

talk freely and be confident of others understanding them. Such incredible invention can surely irritate some people as it eliminates the need for learning languages. But, in reality, it is always more fruitful to have advanced knowledge of a language yourself than to rely on technology. However, it acts as a wonderful way to cut corners for those who are only studying or seeking to begin studying. Human society must aim for making the lives of all its' inhabitants better.

Secondly, the role of artificial intelligence on linguistic level in society is crucial. Language and its proper functioning and development is vital for the well-being of any community in the world and the possibilities AI brings for language sustainability are revolutionizing. Since the world is currently in its' active stage of globalization and international and intercultural development, the need for interlingual communication skyrockets. It all begins with education sphere which enables new generations to acquire essential skills and experience gained by previous generations and transform it into their own understanding of the world. The use of AI in education can obviously nullify all the effort made by teachers and professors since it presents students with an easy way to complete tasks without any difficulties. That is one way to look at the situation. Another way is noticing and accepting the lack of clarity in today's education system in many countries. For example, in Ukraine education systems for young pupils, teenagers and students is swarmed with subjects, topics and tasks that have little to no relevancy. According to an independent Ukrainian news portal Mind and its most recent research on the state of education system in a country, many analytics, professors and students confirm that those who receive education are forced to cover large quantities of material that they rarely find useful or attractive. Obviously, such statements can be purely subjective and reflect the positions of those who are simply uninterested in a specific problem. At the same time, they can highlight the overall challenge modern society needs to face – due to generational shift, conventional methods of teaching may not be fruitful for students of day. The implementation of artificial intelligence can boost student curiosity and engagement while also simplifying the structuring of material for pedagogues, many of whom left the country that is being ravaged by war. **[22]**

The same situation applies to other countries besides Ukraine. The usage of AI in education, cultural sphere and linguistics is a step into the future where societies across the globe can manage to interact freely and tackle problems together.

The moral and ethical aspects of artificial intelligence use require careful consideration, as the integration of AI into daily life raises profound questions about responsibility, autonomy, and the preservation of human values. The difficulty of such decision comes from the ability of AI to enhance efficiency, foster innovation, and solve complex problems but also to bring numerous challenges such as algorithmic bias, the cancellation of privacy, and the risk of diminishing human agency. As societies increasingly rely on AI-driven decisions in sectors like education, healthcare, and governance, it becomes essential to establish transparent frameworks and accountability mechanisms that ensure ethical standards continuity and maintenance. Moreover, ongoing dialogue among policymakers, technologists, and the public is crucial to navigate dilemmas around fairness, consent, and the equitable distribution of AI's benefits. Such dialogues and reaching of sole decision can shape a future where technology serves humanity without compromising its core principles.

Moreover, the use of AI can eliminate cultural differences and problems that occur due to them. The lack of clarity among people of diverse cultures and society around the world that must cooperate and coexist together can be exterminated by a clever implementation of modern technologies that are able to put down language barriers, societal prejudice, and bias. As AI continues to advance, its capacity to promote mutual understanding and collaboration between nations becomes increasingly significant. Consequently, it paves the way for more harmonious international relations and fosters a sense of global unity among different societies. Effortless communication and absence of misunderstandings are potential results of artificial intelligence use, and it can empower communities to work together. Instead of solving and arguing about cultural differences, humanity can focus on achieving shared goals and setting future aims. This interconnectedness, nurtured by intelligent

technologies, holds the promise of a future where progress is driven not only by innovation but also by cooperation and respect among diverse peoples.

Conclusions for Chapter 1

Throughout the course of human history and centuries of development, communication dogmas, principles, theory, and practices changed and evolved accordingly. Technological progress has always been and will remain a significant factor that has altered and continues to alter the way people communicate with one another and transmit information. From the ancient primordial written texts and first bilingual speakers to printed press and industrialization and lastly to modern machine translation mechanisms and artificial intelligence language models – people always strived for quick and precise information exchange and exploited the resources available to for the maximum possible output.

The role of standardized translation and all concurring processes has been significant by itself. While many can argue that it was limited and rarely provide translations that can actually bear value, since back in the past there were no stable rules to control and regulate the flow of translation as well as mechanisms for active feedback and errors management, translation was exactly the reason why the predecessors of many well-developed society we know today exist and flourish. Translation and interpretation enabled humans to perform complex tasks and exchange knowledge that was out of reach before. They also allowed for sharing that knowledge and multiplying its' quantity and value exponentially.

During Ancient times, first translators were valuable adversaries whose knowledge influenced the relations between entire states. Their mistakes were costly, but they also played crucial role in structuring the world order and forming initial political unions, agreements and constants.

Medieval Age was a period of violence and relentless conflicts where the role of translation curved from mediation, cultural exchange and technological advances into a means of military pressure, political resilience and peace establishment. Wars, struggles for power and authority and rise of the importance of continental

interactions led translation and interpretation into the field where human emotions and desires and how well they can be conveyed from one language to another had the potential to change demographic, ethnic, cultural and political picture of separate parts of the world.

Industrialization was the period when communication appeared on a world-wide scale. The invention of printed press allowed people from different parts of the world to consume information in far greater amounts. It led to obvious increases in general knowledge, common sense and understanding of the environment. However, it also increased the capacity at which translation was to be operated. Many occasions for interlingual interaction became common for everyday lives and also for the welfare of countries who entered a more active phase of political coexistence. At the same time, cultural trends began to shift due to increasing awareness of society of existence cultures around the world.

The most recent and the most fascinating advance in terms of linguistic approaches to translation and interpretation is machine translation and large language models that operate based on algorithms and database information use. These systems appeared thanks to global unification of world communication systems and borders transparency among countries. The need for communication increased together with the number of people. The appearance of computers, the Internet and social media forced communication on a whole new level where people cannot wait for a response for long.

The impact of modern artificial technologies is felt even on physiological level – it brings the decrease in attention span and deficit in interests among use and their willingness to explore due to oversimplified access to poorly generated content the value of which is low since it took neither effort nor creativity to produce it.

The language itself changes the course of its development due to AI use. People are no longer required to be skilled in structuring great ideas since it can be done by computers much more quickly. The impact of artificial intelligence on our society is beyond compare.

CHAPTER 2. CAPABILITIES, LIMITATIONS, AND LINGUISTIC POTENTIAL OF MODERN ARTIFICIAL INTELLIGENCE

2.1. AI as a Cultural and Linguistic Phenomenon in the 21st Century

For many years, cultures around the world developed and changed according to their own vision without much reliance on the trends abroad. People, ethnicities and society preserved their own customs, traditions and superstitions which allowed our planet to be filled with unique and diverse representatives. With the course of history, the need for international communication has increased. Due to rapid economic growth and increasing potential in international cooperation, there is no country left the world that would not be willing to learn and explore cultural aspects of history of another country. Cross-cultural coexistence is essential for the world of today where it is much more difficult to hide or misrepresent facts.

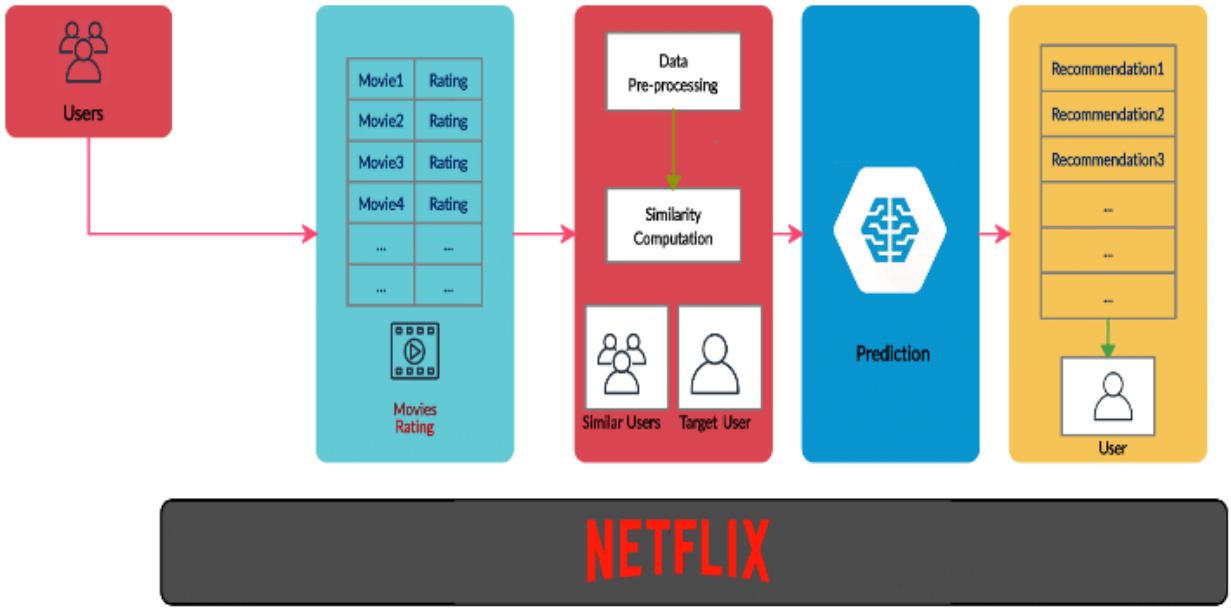
Language, as a part of culture of a nation, is influenced by the above-mentioned changes as well. There are approximately 7,200 languages in the world, most of which are widely used and have thousands of active speakers. It implies that linguistic form of expression has the way to be used both verbally and non-verbally. Speech, writing and variety of expression forms have been evolving for thousands of years and are currently facing the greatest challenge – they are becoming obsolete in the eyes of new generations who prefer online forms of communication. Artificial intelligence is already widely used in daily communication. However, the essence of its positive or negative effects on the way people communicate remains a topic of research nowadays. Scientists around the world conduct experiments targeted at investigating the social consequences of one of the most pervasive AI tools - algorithmic response, which is involved in carrying out billions of messages every day. These experiments provide evidence that these systems change the way people interact with and perceive one another in both pro-social and anti-social ways, which defines the direct impact of artificial intelligence on language use and social relationships. The most important positive implications of AI use in communication

are the increasing speed of communication itself, higher prospects of establishing cooperation and lower risks of negativity existence. Nevertheless, increasing use of AI and computer-based communication can weaken the essential skills of live speech which can negatively affect people around the world. **[23]**

Individuals engage in communication through various channels, including oral, written, and performative forms. Of these, linguistic exchange is both the most prevalent and significant, as it fosters interpersonal connections and supports societal cohesion. Nevertheless, factors such as language barriers, cultural stereotypes, and unequal access to opportunities can restrict the scope and inclusivity of such communications.

If we talk about cultural impact once again, it is safe to say that artificial intelligence now has its presence in the entirety of cultural spheres. Economic growth and world trade cannot operate as quickly as they do know without the usage of modern technologies, especially if we mention online-only commerce. International giants like Amazon, eBay and Temu use algorithms-based recommendations for their customers which includes replenishing their online presence and activity with product placement and advertisements for products they are interested in. It can also go beyond well-established norms of privacy when organizations like Google use the person's own hardware and software to get information about their preferences and interests.

Movies, art, music, poetry and videomaking – all forms of content creation and sharing have AI involved in them. Starting with movies, the clearest example of AI use for customers comfort and data collection is Netflix. Netflix is a subscription-based streaming service that offers a wide variety of movies, TV shows, anime, documentaries, and games to watch on internet-connected devices. It stores one of the largest collections of visualized content in the world and active implements artificial intelligence for creation the best user experience and rapidness in finding suitable content. The recommendation system of Netflix which operates based on constant collection of input of its users and prediction of interests of similar users is one of the most well-known examples of AI capabilities.



Picture 1. Netflix recommendation system and how it affects the experience of users.

Linguistic aspect of artificial intelligence exploitation is most visible in the popular streaming platform Youtube. YouTube is a free online video-sharing platform where users can upload, watch, and share a vast range of videos, which was founded in 2005 and is now owned by Google. Initially, this platform was a niche project where enthusiasts uploaded simplistic forms of content for entertainment. It all changes went in the early 2010s Youtube introduced monetization scheme for its most successful content creators. It provoked drastic increase in the number of its users which also signified the growing quality of content itself since demand was exponentially spreading. Nowadays, Youtube is the home of approximately five billion videos which together sum up one hundred billion hours of content. And, with the introduction of the Internet and social media to different corners of our world throughout last few decades, the need for specific content to have a proper translation to different languages is essential. At first, such need was covered by content creators themselves who voiced over their own videos. However, not all creators possessed

patience, knowledge, and skills to effectively present their videos in multiple languages. This problem can easily be solved by inviting professional voice actors or regular native speakers, which, although, implies additional costs and spendings. The years 2015-2017 marked the start for AI-voiceovers revolution. During that period, artificial intelligence first crossed the barrier of written language and stepped into oral expression of idea. Such functions as automized subtitle generations and interpretation into a different language become usual for each piece of content. Even the authors himself worked on creating Ukrainian subtitles for English videos on videogames in 2014 – it took half a day to structure and organize each phrase and abstract after a careful and thoughtful translation. Today, when AI can perform the same task in matter of seconds, such endeavors become useless. According to independent online portal Sherwood, AI-generated videos are taking over the platform with the top four AI channels boasting more than twenty-three million subscribers and eight hundred million views combined. Furthermore, the algorithm clearly favors AI channels now, enough that they are getting a much better ratio of views to subscriptions and are suggested more to viewers than human-manufactured videos.

Picture 2. Automized AI-voiceovers in YouTube.

Besides films and videos, where the role of automized recommendations and subtitles cannot be underestimated, robots spread their influence on music and art as well. The most popular music streaming in the world, Spotify, uses AI to, just like Netflix, present its users with automatically generated playlists and recommendation lists which are based on recently listened to pieces of music as well as national preferences of all users in a specific area. And while such features can be marked as beneficial since simplifies the search for favorable content for people, the main danger comes from the AI which is used for creating music without human interference. While professional singers need time for preparation and resourcefulness to release new albums or singles, platforms like AIVA, Amper Music and Mubert that use AI-generated voices, can produce dozens of generic and unoriginal compositions every day. According to Deezer, which is a French music streaming service with a vast library of songs, podcasts, and radio stations, 0.5% of all music and songs on Spotify are automatically generated and have nothing to do with human effort. Even more devastating is the fact that about 28% of all suggested music for Spotify is now the one generated by computerized systems. And while Spotify is paying close attention to deleting “spammy” AI creations and introduces filters that detect artificial intelligence, the trend is visible with the unaided eye.

The situation is worse for digital artists where full-scale protests about the usage of artificial intelligence in creating images and pictures reached their peak in 2023-2024. With the data collected by Artsmart.ai, statistics for 2024 show that approximately 30% of all digital artists use automized image generators in their work while selling them as authentic products. Resources like DeepAI, Canva and Midjourney present Internet users with the ability to generate a wished picture after receiving a prompt description.

Artificial intelligence still has troubles picturing people and their emotions, animals or basic structures – they look generic and unnatural, emitting the so-called “uncanny valley” effect which allows people to identify such content fast. However, the more development AI models receive, the more undistinguishable their creations will become. **[5]**

Picture 3. Examples of images generated by AI-based platform Midjourney.

Artificial intelligence has an immense impact on our cultural and everyday life since it enables functionality on an entirely different level. Cinematography, music, art, and entertainment spheres change due to the implementation of automized technologies. Languages, which are the key factors to the existence of all previously listed forms of cultural expression, change as well. As artificial intelligence continues to evolve, its influence on language becomes increasingly profound, shaping not only the way we communicate but also how we interpret and create cultural artifacts. The very process of content discovery, and translation is being redefined by advanced algorithms that facilitate more personalised and accessible experiences. This ongoing transformation prompts us to reconsider the role of human creativity and authenticity within cultural production. The dynamic interaction between artificial intelligence and language signals a broader shift in cultural identity, challenging societies to adapt

to new methods of expression while safeguarding the values and nuances that define human connection.

2.2. Benefits of AI in Translation. The Simplicity of AI Use in Translation Tasks Completion.

Translation studies as a scholarly discipline have been developed tremendously in last decades mostly due to the implementation of AI-based technologies, such as machine translation, large language models, and professional translation tools. Interpretation was not left behind either with modern technologies appearing today that allow people to speak their own language and perceive another language simultaneously without wasting time nor needing a lot of specific equipment. AI is an essential tool which erases the barriers of intercultural and international communication and its impact is especially noticeable in education, business, political premises, and trade. Given the fact that, in our modern world, humanity strives for quality in accordance with speed and everything is happening at a fast pace, the implementation of AI and its increasing quantity is inevitable.

The capabilities of artificial intelligence methods in academic field allow scholars and researchers to cover a vast amount of texts and resources and deal with deep and thorough translation of a variety of materials due to the existence of algorithms that can simulate the best possible scenario for translation, eliminate mistakes and organize the overall structure of the given abstract based on previously received data from users.

The creation of automatic computerized systems that can mimic human intelligence and rely solely on facts and data without consideration of emotions opens a vast number of possibilities and adds complexity to how human communication may be perceived in the future. AI technologies, such natural language processing, large language models, and machine translation change the way languages around the world are perceived, managed, and interpreted. The development of such systems leads to a complete revamp of human understanding of how communication processes can be conveyed and introduces the world where the flow of interaction is not obstructed by language barriers or cultural traditions.

Computerized translation tools, which grant the ability to convey substantial amounts of information between different languages, are constantly being changed and developed. Some of the most popular and important AI translation tools of today are Google and Microsoft Translators, which can perform basic translations and are helpful for everyday needs and simplistic requests, Amazon Translate and Memsource, which represent business and commercial sphere and operate on machine learning and computer-aided translation systems. At the same time, there are programs like DeepL and Reverso Context that receives great recognition and praise for a much deeper and conscious translation of context and ideas, rather than simply words and phrases. Reverso Context allows people to choose the most fitting translation among the variety of option and is not limited by contextual barriers since it operates on various levels of linguistic spheres. DeepL rules an enormous database of information which also includes idiomatic expressions and specific phrases the translation of which with the usage of simple word-to-word or sentence-to-sentence techniques is impossible. It allows operates fast and possesses the ability to translate entire documents which turns it from a regular cloud-based tool into a vital instrument for most business and enterprises.

Currently available translation tools are essential in the lives of both ordinary people and organisations of any kind, like personal business, large public companies, and commercial organisations. AI tools provide clarity, effectiveness, quality, and overall availability of translation. The usage of artificial intelligence simplifies bureaucratic, financial, and cooperative mechanisms inside organisations.

The speed and efficiency of the conveyed translation and interpretation are the main reasons why most experts believe that conventional methods of translation are no longer suitable for the modern world. Human-based translation is simply too slow or ineffective for today's world needs. Considering the number of translations that every sphere needs to be conducted daily, such as product placement, advertisements and online content multiplying presence and interpretation and its' increasing live potential and need, AI tools become irreplaceable in terms of international communication, commerce, and cultural activities.

Another reason for the active use of AI is its clarity and effectiveness in everyday life. Instead of looking for a proper translation in dictionaries or on relevant sites, every user can simply refer to translators available online. They cover the need for simple translation and decrease the amount of time we need to wait for the desired result.

One more key factor is cost-effectiveness of AI-based systems for translation and interpretation. Scholars and modern experts consider the use of automized technologies as an inexpensive replacement for human translators. While human translators require time for preparation and can be affected by unpredictable circumstances or emotional states, artificial intelligence requires minimum amount of support and maintenance. It also functions without payments and salaries which makes it favorable for small businesses and non-profitable organizations like schools, institutes, universities and private enterprises. However, even the giants of international market like Microsoft, Amazon, Walmart, Coca-Cola and Meta implement artificial intelligence technologies for a wide range of applications, from personalizing customer experiences and automating marketing campaigns to generating content and improving search engine optimization.

Another advantage of using AI tools for translation is the level of consistency and accuracy of the content they produce. Unlike human professionals, artificial intelligence cannot forget words or meanings or get tired after hours of tiring work. And if we talk about consistency, the usage of machine translation methods takes away the problem with translators' individuality. Every human translator, even though he is a professional, prefers to use their own techniques and leans to certain methodology or individual preferences which can lead to inconsistencies in translation and complete difference in meanings of the same given information from different professionals. Once again, AI is affected neither by emotions nor a desire to express the idea creatively or artistically which makes its translations reliable and structured without major differences or flaws. Additionally, neural machine translation has significantly increased the dependability of producing AI translations. One of the programs that sets itself apart is, once again, DeepL, which produces

translations that are quite close to human-quality in terms of coherence and fluency, while spending way less time on them. These provide better translations by using enormous datasets and sophisticated neural networks to interpret proverbs, context, and colloquial language. **[44]**

Talking about large international companies and the most appropriate example of artificial intelligence usage in corporal sphere, Google is the first candidate for mentioning. Google uses AI-based translation in its own Google Translate service that processes billions of requests and grants users the ability to preserve context and ideas of the original text. Microsoft incorporates AI translation tools into Microsoft Translator and the Microsoft 365 ecosystem, supporting real-time multilingual collaboration through features such as subtitles, live meeting translation, and cross-lingual document processing. Amazon uses AI translation in Amazon Translate to improve customer–seller communication on its marketplace and to support multilingual product listings, improving accessibility for global users. Also, the earlier-mentioned streaming platform Netflix actively uses AI for creating the best experience for its users while also automizing the recommendation tools and revolutionizing search algorithms. The overall use of AI in all these contexts provides several key benefits, which include faster and more scalable translation workflows, reduced dependency on human labor for repetitive linguistic tasks, improved consistency and terminology management, and enhanced accessibility of digital content for users worldwide.

Overall, the benefits of AI use in linguistic aspects of humanity's existence are hard to overestimate. Artificial intelligence provides an invaluable outlet to international cooperation, markets development, cultural exchange and introduces even more possibilities for innovative communication models to transcend traditional limitations of translation. With the evolution and adaptability of AI technologies being consistent, they are likely to adapt to new forms of collaboration and support the preservation of minority languages. The positive effects of AI-based tools implementation lie in their ability to transcend well-established norms of

communication and to allow speakers around the world to understand one another more precisely in contextual way.

2.3. Risks and Challenges: Cultural Difficulties, Ethical Concerns, Labour Market Shifts, and Deskilling

2.3.1. Cultural Differences in AI Functionality

While artificial intelligence undoubtedly is beneficial to the welfare of economies, markets, institutions, organizations, and individuals by providing them with the desired materials faster than any human could do, the risks and challenges that AI brings are on the same level of importance as the positive sides. Algorithms and computerized translation can simplify and foster linguistic activity, but it also eliminates the creativity and emotional side of translation. The author previously mentioned it that the lack of emotionality and over-expressiveness in translation is an upgrade and one of the reasons why many companies prefer to use, for example, machine translation in their operations. And it is true that the results merit the methods used to achieve them. But if we abstract from purely materialistic view on the problem, we can notice that the absence of human touch in translation and its over-reliance on artificial intelligence technologies, especially in recent years, can lead to overgeneralization of the whole sphere and extinction of separate ideas, identities and cultural spirits. What makes people, ethnicities, and organizations distinct from one another is the ability to express similar ideas in separate ways thanks to difference we all have in mentality, world perception, and the influence of traditions. If we take away individualistic aspect and originality of translation, we will receive an obscure exchange of already predetermined messages that carry no value besides dry statistics and constatation of facts. It is very unlikely that computers will ever be able to replicate humans' emotions. And even if we ourselves succeed in granting the machines ability to mimic emotional aspects of our essence, these efforts will be noticeable with the naked eye. Artificial intelligence follows clear patterns that are given to them by established algorithms – they look for the paths of minimum

resistance while human technique is the way of most expressive connotations and methods of self-expression. **[19, p.740-754]**

With that problem in mind, another risk and challenge of AI use stems accordingly – AI's inability to carry most contextual, cultural, and idiomatic expression and meanings. Obviously, some machine translation mechanisms like DeepL are more advanced than others and, therefore, can produce high-quality translations of different forms of given text. At the same time, it lacks the understanding of how cultures and languages developed historically, how they constantly change in the world all the time and how the same phrases cannot always be translated with the same connotation from one language to another. For example, referring to idioms, it is not always easy for modern translation tools to operate with stable expressions and even the most advanced versions of AI translation tools can face an unsurmountable challenge of handling expressions that don't always have meanings in both Source Language and Target Language.

By way of illustration, the idiom *"bite the bullet"*, which means *"to force oneself to endure something difficult,"* is frequently mistranslated into French as *« mordre la balle »* or into Spanish as *« morder la bala »*, neither of which exist idiomatically in these languages. Similarly, *"let the cat out of the bag,"* meaning *"to reveal a secret,"* often appears in German as *„die Katze aus der Tasche lassen "*, which reads as a strange literal action rather than an idiom. AI systems also mishandle idioms with strong cultural grounding. For instance, "cost an arm and a leg" may be rendered in Chinese as "花一只胳膊和一条腿." It creates an intentional literal translation of a phrase that has no specific meaning in another language. In another example, "the ball is in your court", which signifies that it is someone's turned to act, may be directly translated into French as *« la balle est dans ton court »* — a meaningless phrase — instead of the correct *« la balle est dans ton camp »*. Neural systems also misinterpret figurative idioms such as "get cold feet" (to lose courage), translating it literally into Spanish as *« tener los pies fríos »* or German *„kalte Füße bekommen" when* the idiomatic meaning is not intended. Likewise, "hit the books," which means "to study," is often interpreted literally in Chinese as "打书

” *(“to hit the book”),* which fails to convey the idiomatic sense of academic preparation. Even context-aware models frequently mistranslate “pull someone’s leg,” delivering French *« tirer la jambe de quelqu’un » or Spanish « tirar de la pierna de alguien »*, instead of the proper meaning “to tease.” Another recurring failure is the idiom “once in a blue moon,” which AI tools may translate into German as *„einmal in einem blauen Mond“* or Chinese “在蓝色的月亮时,” both of which are meaningless literal constructions. **[44]**

Similar difficulties exist in English - Ukrainian translations, which presents us with a difficult problem since Ukraine is in the centre of world's attention and many specialists and experts of different fields from different countries communicate with Ukrainian representatives to solve numerous problems. The limitations AI presents in managing the cultural aspect of Ukrainian language may bear danger to international communication and its' productivity.

Unfortunately, the cases of English idioms being mistranslated by AI models are common. For instance, “kick the bucket” turns into its literal equivalent, producing phrases such as “вдарити ногою по відру” instead of the intended meaning “to die.” Similarly, the idiom “it’s raining cats and dogs” is occasionally translated literally as “йдуть дощі з котів і собак” or something from a different context as “все і зразу” (everything at the same time), which is far from the correct meaning of heavy rainfall. More of the similar mistakes are: “spill the beans” is translated as “розсипати квасолю” instead of “reveal a secret,”; “break the ice” becomes “зламати лід” or even “розслабитись” (to relax), rather than “finally begin a conversation in an unfavourable atmosphere”. In some cases, even context-aware models misinterpret idioms like “beat around the bush,” producing literal translations such as “бити навколо куща” or “бити байдики” stretching away from the intended meaning, which is “avoid giving a direct answer.”

These examples collectively demonstrate that idioms remain a significant obstacle for AI translation because they require not only semantic processing but also cultural, contextual, and pragmatic awareness. These are the competencies that current models still cannot consistently replicate and demonstrate full awareness of.

The difficulties of AI-based translation in cultural spheres of our lives are even more notable than the ones connected to idioms and idiomatic expressions. Artificial intelligence tends to work with given material in a pragmatic and practical way, completely ignoring the possibility of cultural mismatches between the languages of the specific situation and omitting vital details of the terms that carry immense value if translated properly into the target language.

National terms and definitions like names of items of cuisine or public holidays are amongst those specificities where human control is essential for computers' well-functioning during translation. For example, human translators know the nuisances of Indian, Mexican, or Chinese cuisine and how the names of visibly similar dishes should be translated. At the same time, machine translation transforms Indian *masala, korma, saag* and *vindaloo* into "*curry*," which may not seem a dangerous issue at first, but can bring confusion and signs of disrespect to Indian culture. And disrespect of the culture is one of the things all people must avoid and exterminate to establish a fruitful international communication. The same goes for Chinese *ramen*, which, in AI's algorithms, can simultaneously mean *Wonton, Sichuan, Yunnan and Lanzhou* noodles soup, although, they are all very distinguishable dishes with rich history. **[7, p.134-156]**

One may argue that such details are not crucial for the business operations since they do not reflect the matters of uppermost importance. However, as it was previously mentioned, ethics, morals, and appreciation of cultures of both sides of communication are essential for trust, friendliness, and productivity. Occasionally, translation applications reform Ukrainian *varenyky* into *pierogi, Boxing Day* into *The Day of the Box* or *Boxing* as a kind of sport.

One of the most striking examples of AI's misinterpretation in cultural translations is how it oversees the translation of a national Mexican holiday *El Dia de Muerte (All Souls' Day)*. The difficulty with this holiday is in the context it brings and attitude of people towards natural phenomena. While the cultures of Europe and the United Stated of America perceive death as totally negative and never embrace it, Mexican side, on the other hand, celebrates the occasion deeply enrooted in their

national ethnicity – the moment when the loved ones who already passed away come back to see the living once again. Upon translating the name of this holiday and similar, culturally infused topics, it is important to understand not just the connotation and linguistic aspect, but the value this term possesses in the culture it originated from. Direct translations often bring much darker connotations into a target language than they had in the source language, which can shift the entire trajectory of the conversation and cause confusion since different sides will have different attitude towards the topic.

Arguably the most difficult topic for artificial intelligence to get familiar with is localization. Localization is an essential part of cross-linguistic transformation which stands as the mediator between two languages and allows specific terminology to cross the language barrier. It changes the words and explanations used in the original text to something completely different in another language. However, it is a forced change which is caused by the difference in realia of two sides of communication. Changing political terminology, humor, trends and social phenomena, noticing and adjusting references and forms of politeness, paying attention to the target audience and considering regional specificities are duties of those who work with professional localization, and AI, currently, is incapable of most of it. These problems include such basic information as dates, currencies and units of measurement, that are the foundation of knowledge for well-educated translators and interpreters. The same aspects, however, cause massive problems for computerized translation systems due to their tendencies of generalization of the content.

Identical problems appear in the videogaming industry, which is currently the most profitable among digital forms of entertainment, surpassing cinematography, music and, essentially, all rivals. For example, Larian Studios, an independent Belgian company-developer of videogames addressed the problem and debates around the usage of AI instead of real voice-actors by stating that artificial intelligence, in the conditions it operates at right now, is inferior to real people's capabilities in terms of emotional output and willingness to convey the feelings and sufferings of characters. The studio also rejected artificial translations completely

since they cannot convey the deep meaning of a fantasy Medieval world, where magical terms are tightly interconnected with allusions on real-world political schemes and affairs, as well as people's social struggles. The mistakes and inaccuracies of AI lead to the destruction of immersiveness, especially when the names of the characters like Shadowheart, Ghost, Private Shephard and Traveler are translated into another language, like Ukrainian, as follows: *Тінь Серця*, *Привид, Рядовий Пастух* and *Турист*, respectively. The professional humanized counterparts of these translations which are *Тінесерда, Ґоуст, Рядовий Шепард* and *Перщопроходець* much more clearly resemble the spirit of the respective creations they are parts of and allows consumers to fully submerge in the universe without being distracted by the clearly AI-produced content.

Such cases act as determining factors in conversations and discussions about the current problem of artificial intelligence taking over labor market, with more and more people losing their positions and prospective careers due to the accessibility of robots and their increasing functional potential.

2.3.2. Ethical Concerns, Labour Market Shifts, and Deskilling as the Key Trouble Points in AI Overall Implementation

Artificial intelligence has been a growing concern for numerous professions and specialties for decades. Its rapid development complemented by a dash of technological progress allowed people around the world to substitute human workforce with much less needy and demanding robotized mechanisms, computers and algorithms. Such tendencies changed entire processes and curvature of global market functioning, reshaped the essence of professional areas and made millions of workers in different countries redundant. The problem of AI replacing real digital artists has been discussed in previous chapters. However, while art is the sphere that artificial intelligence just recently started to conquer, manufacturing, for instance, is the area where humans have been coexisting with robots and computers for almost half a century. In this industry, robots are responsible for performing routine tasks, handling assembly of products and conducting quality checks while controlling regulations compliance. Meanwhile, in transportation, self-driving vehicles threaten

to decrease the demand for human drivers as they are less reliable and, as opposed to computers, are heavily affected by tiredness, stress and emotional burnouts.

The risk of implementing AI is mostly connected with routine tasks where the role of people is to perform the same activity over a long period of time. For somebody it can have a positive effect, as fewer people are to be in risk of harm while working and can dedicate their time to other processes where their life and health are secured and protected. However, AI influence is not limited to manual labour—white-collar roles, including data processing and customer service, are also being replaced by AI systems. This fact raises concerns towards the ethical aspect of AI use and expediency of harming and limiting people in their own habitat with their replacement by artificial intelligence. **[6, p.346-353]**

The duality of digitalization of most professions nowadays is that it reduces the number of vacancies in spheres like manufacturing, transportation, and hard physical labour, but it also created other positions that are responsible for monitoring and controlling the actions of robots. At the same time, the growing demand for technical skills such as data analysis, could-computing, cybersecurity, and machine computation is matched by the need for experts in terms of soft skills like decision-making, critical thinking, and stress resilience. Artificial intelligence is pursuing the world market and the professions that lose most workers must focus on finding new vacant positions for redundant people to overcome the arising problem of mass unemployment in any countries. The exploitation of AI does not only harm people who become unemployed because of but economies as well. By replacing humans with computers and robots, companies get fewer actual workers who can receive salaries and who, with stable income, can contribute to the well-being of the entire economy. Making all workplaces filled with artificial intelligence puts a whole country in danger, since people, who have no place to work will try to find a new place for employment in another region or country. **[17]**

One way to overcome such situation is to introduce massive reskilling to the workers of endangered professions. It is a natural process of certain professions becoming unneeded due to technological development or cultural shift. However,

nowadays, it is within the national interest of a state to allow people to rehearse their current skills and reshape them to be able to enter the market again and get a position. Specialized trainings, skills exchange sessions, education courses and modernizing initiatives must be implemented to ensure that current and future workers can successfully adapt to the evolving needs of market.

Another ethical problem is the instability and injustice the developing AI-market creates. Since the demand for AI-specialists grows exponentially, the salaries and perks available in this sphere rise as well, while leaving other areas behind. Naturally, younger generations strive for a better income and prestige while conventional professions, like teachers and social workers, and respective areas are no longer under consideration. **[37, p.643-661]**

The problem is most apparent in developed countries, where the level of education is higher for people who can pay for it, thus giving skilled workers even more advantage over others. At the same time, people who live in the areas that are currently developing or those with limited education infrastructure access struggle to adapt to AI-controlled markets and economies. As a result, the gap between people who can operate with artificial intelligence and those who cannot widens even more and can lead to professional and social instability, inequality, stagnation, and regress.

To reach growth and comprehensive development, governments, regional institutions, organizations, and trade unions need to work together on inventing and stabilizing approaches that will permit society to prosper during the age of AI. Otherwise, inability to cooperate in such conditions will lead to the increase of public outcry and rebellions against artificial intelligence. In this matter, the following data from 2022 shares the valuable foresight: the share of tasks performed by machines was 34% and the share of tasks performed by humans was 66%, while the same data by 2027 are expected to be, respectively, 43% and 57%. As it becomes clear, the trends for AI implementation in labour are currently negative. However, with proper management, creation of new workplace for relevant professionals and education of the population about the capabilities and importance of artificial intelligence, such struggles can be transformed into a foundation of fruitful cooperation between

computers and people. Although, such approaches need to be carefully considered and approbated so that global deskilling does not affect them irreversibly. **[52, p.221-226]**

Deskilling is the constant reduction of workers' skills and abilities due to their insignificant role in the processes they have to perform and the overwhelming presence of automized systems which eliminate the need for workers to actively participate. Deskilling is a serious problem since it leads not just to the stagnation of potential workers in one company or region, but to destabilization of entire area. For example, considering the spheres of translation and interpretation, use of artificial intelligence has already impacted on the quality of products delivered regularly. Experienced professionals find it difficult to adjust their skills to modern day needs while young professionals reject common techniques and refer to much easier means of translation – the ones induced by AI. This shift not only undermines the value of deeply developed linguistic expertise but also contributes to a broader erosion of skillsets across industries that rely on precision and human insight.

The grows of the popularity of AI-driven solutions increases the temptation individuals and businesses have in prioritizing efficiency over nuanced understanding, which puts at risk the sophisticated judgment and adaptability that once were omnipresent. As a result, the relentless advancement of artificial intelligence threatens to mitigate the richness of human contribution and make preservation of specialized skills a critical condition. To fight such extreme conditions, education should be reformed completely. The reforms should include not only the ways to minimize the usage of AI-driven technologies by students and embracing of creativity and independent thinking but also introduce the ways artificial intelligence can be implemented into studying processes naturally, without harming students' creativity and individuality.

Overall, besides the benefits AI presents to our society, it also introduces numerous risks, the handling of which relies solely on how our society will perceive computerized activities in the following years. Computers and robots have already taken away specific spheres of human professional activities, so it is reasonable to

assume that the influence artificial intelligence has now is likely to extend into other domains that were once considered exclusively human territory. Nowadays it is imperative to foster a balanced approach between innovation and the pursuit of efficiency without sacrificing the core values, skills, and social stability that our civilization has. The trajectory of societal development will determine whether AI acts as a catalyst for shared prosperity and growth, or as a force that destroys the progress achieved by countless generations.

2.4. Strengths and Weaknesses of AI Translation. Lack of Creativity and Individuality

Across the development of artificial intelligence and automized translations methods and techniques, AI highlighted strengths and weaknesses in conveying translation and similar objectives. The most apparent strengths of machine translation are that it is quick and adaptable to any style of translation it must operate in. There are no limitations to its use and artificial intelligence cannot be unfamiliar with any topics given. Other advantages of implementing computerized systems into translation include:

- *high speed and efficiency*
- *overall availability and scalability*
- *cost-effectiveness*
- *resource management*
- *accessible integration with technology*
- *expertise in rare languages*

Taking things altogether, artificial intelligence possesses immense potential in turning the tides of human society development. *High speed* of translation and interpretation allows for quicker communication process, smaller amounts of delays between operations and prompt cooperation between customers and organizations where AI usage is implemented. Such commons tasks as essay translation or website localization that would take even professional translators a lot of time of thorough and laborious processing are performed almost immediately by machine translation models and LLMs. *Efficiency* of artificial intelligence in translation transcends human

capabilities and outweighs limitations the workers have. AI can resort to mass production of translated materials without the need for rest, recharge, support or additional motivation. The effectiveness of translation applications is determined by the amount of workload put on them and technical aspects of hardware and servers on which they operate. **[8, p.7-12]**

Availability of computer-based translation overcomes that of humans since the former can function uninterruptedly and work on many requests simultaneously. Artificial intelligence does not have shifts, cannot and does not need to pass the task to someone with better qualifications in certain fields, and it has no reason to wait until technical difficulties or outer disasters are dealt with. The *scalability* of AI models is important as they can be reached in every part of the world without any additional sources besides Internet connection. They do not require any correspondence means and waste no time to clarify or gain additional details or remarks about the request. While the team of professionals would be needed to provide high-quality translation of a 100-page document about cultural impact of football in Brazil, for example, AI can do it in a matter of seconds.

Cost-effectiveness is the factor which is most important for organizations or independent figures that frequently need the translation of large-scale products. Constant invitations from human experts are costly for many businesses, which leaves artificial intelligence as the only available alternative. Moreover, AI tools mostly require only one-time payment or yearly subscription plans which are much lower than salaries of real workers.

Resource management is another aspect in which people lose to their own computerized creation. AI fully uses the capabilities of resources given and wastes neither time nor material in task completion. Since computers cannot “forget” about the existence of any piece of information they receive, the users can expect the result provided by AI to contain all data they requested for and its maximum structure and both logical and practical sequence.

Accessible integration with modern technology is a topic which is not related to people but the one the signifies how quickly artificial intelligence and correlated

mechanisms developed so that they get instantly included into new inventions and advances. Most applications, programs and pieces of cultural expression contain AI systems prebuilt in them since they enable faster and easier data collection, more pleasant user experience establishment and adaptation to vast variety of needs among users from different countries. Latest technologies allow artificial intelligence to mimic humans' voices, build actual conversation and act as adversaries in solving technical problems in numerous fields. Companies like Nvidia, Microsoft, Apple and Samsung explicitly use AI-based technical assistants which replace humans in productive communication with users and solve the occurring problems faster due to immense algorithms and databases. Apple and Amazon, two giants of modern economical sector, have their own voice-activated digital assistants implemented into their products – Siri and Alexa, respectively. Users can actively communicate with these assistants who can answer simple questions and find information online faster than it would have been done by people themselves. These assistants and other AI tools can operate in almost any known language which makes their potential in problem-solving activities endless. **[35]**

Speaking about languages, artificial intelligence possesses *great linguistic expertise* in not only most common and widespread languages like English, Spanish or Chinese but in those languages that are endangered, rare or highly specific. The biggest attention of linguistic society was turned to the initiatives of Google and Meta, which is called "No Languages Left Behind". This project aims at increasing awareness and presence of languages, the use of which is reducing or losing relevance. For example, Quechua and Hawaiian languages of South and North America respectively received their own translation tools while the quality of translation Banjaras language, which is vital for countless groups of Indigenous peoples of Indonesia, was significantly improved. Endangered languages of Africa like Yoruba, Amharic, Zulu, and Kinyarwanda are also being preserved thanks to the existence of AI-empowered platforms like Masakhane. The case of Zulu language is especially illustrative as this language is one of the last signs of cultural presence of powerful military and political force that existed in Southern Africa at the beginning

of 19th century. Zulu Kingdom, led by Shaka Zulu, was one of the most prominent state-like entities in the history of this continent which revolutionized approach to military affairs and established overall cultural and economic dominance prior to the expansion of the British Empire. **[48, p.252-254]**

With that being said, preservation and upkeep of languages is one of the most crucial factors that allow artificial intelligence to dominate in linguistic field. However, apart from positive sides, the disadvantages of AI use are present as well.

The weaknesses and disadvantages of AI exploitation in translation and interpretation, though previously discussed must be meticulously organized and highlighted, hence allowing us to clarify most visible flaws and revitalize assets and methods that are to be used for potential extermination of existing problems. The most impactful weaknesses of AI-powered translation are:

- *cultural and contextual unclarity*
- *ambiguity deficit*
- *inconsistency with languages efficiency*
- *inaccuracies in literal translations*
- *creative, stylistic and emotional lackluster*
- *biases and ethical concerns*
- *Localization limitations*
- *overdependence on data analysis and inability to divert from it*

Although the disadvantages of AI use in translation are numerous, they all underline one idea – computers cannot perceive material and information in the way people do it. The results of AI work are based on finding the easiest approach available in their database. And the bigger and more complex this base is, the better final product initiators receive. People who are not familiar with the specificities of artificial intelligence often overexaggerate its abilities and even essence. For instance, many users of ChatGPT and similar models treat them like friends or family members by being overly polite and caring for them. The reality is that, even though artificial intelligence can mimic the expression of emotions, compassion or sheer willingness to communicate and help the users, it does so because it is the best possible way to

conduct such conversation according to the stock of already predetermined dialogues and phrases it stores in its digital warehouse. Artificial intelligence is made to assist people and does not see or perceive communication with our representatives in the way we see it.

The above-mentioned statement contributes to the reason why artificial intelligence faces exasperating difficulties with *context and cultural expressions*. The problem lies in its partial inability to identify them and differentiate such expressions from those of everyday use. Obviously, AI-tools like DeepL that operate on more powerful servers and explicit databases show more prominent results in handling translation of cultural phenomena. However, even most advanced technological assets are not guaranteed to deliver precise translation without human interference.

Another problem is *ambiguity deficit* and artificial intelligence's concentration on the most popular choices in terms of translation accordance. While simple words and sentences together with detailed explanation of context allow AI to perform better, it struggles to conduct translation of phrasal verbs or terms with diverse connotations. The word "get", for example, may become an unbearable challenge to translation applications since its meaning changes depending on which word is added afterwards. Adding the possibility of "get" being put in almost every context and every part of the sentence creates a challenge of enormous difficulty for artificial intelligence. For example, "I didn't get how she managed to get him to get over it so quickly." is the sentence that can stun for a moment even the most experienced professional, let alone AI-based system.

Inconsistency with language efficiency is tightly connected to the topic of initiative of rare languages inclusion into translation mechanisms. On one hand, people make effort to preserve endangered languages thanks to the capabilities of artificial intelligence algorithms. On the other hand, current power scale of AI is not enough for actual and precise representation of these languages, which is now only possible with the appearance of native speakers of respective languages.

Literal translation inaccuracies in AI translation systems exist due to the same reason as contextual problems – computers cannot relate themselves to the authors

who wrote these poems or novel and, consequently, cannot reach the deep meaning embedded in the piece of art. For instance, the poems of Shakespeare that are written in Early Modern English can cause artificial intelligence to lose meaning and images initially intended to be shown by the legendary author.

Lack of emotions, tone and style in translations made by computerized tools exists due to the limitations in the core of these tools and their ineffectiveness in working with texts written in several styles or those that are intentionally diminutive or sarcastic. The shift between tones and stylistic preservation requires human touch as humans can operate beyond logical solutions and optimal decisions. One sentence translated from English into Ukrainian by both an AI-based tool and a human expert show subtle but important difference in approaches to preserving style, tone and emotionality:

“He smiled, but there was a sadness in his eyes that said more than his words ever could.”

1) “Він усміхнувся, але в його очах був смуток, який говорив більше, ніж його слова.”
2) “Він усміхнувся, та в його очах жеврів смуток, що промовляв більше, ніж будь-які слова.”

Both sentences given above retain the meaning and sense of the original text. However, the first translation lacks emotional background and is a sole transformation of words from one language into another. At the same time, the second sentence gives Ukrainian equivalent emotional background and deepness by replacing general and neutral words to emotionally backed variants that carry deeper understanding like “був” to “жеврів,” “говорив” to “промовляв” and simply “але” to “та.” Such minor changes separate humans from computer entities in terms of emotional prowess.

Biases and ethical concerns are matters of uppermost importance in modern life. The existence of tolerance towards all groups of people as well as decreasing amount of prejudice are what pushes society forward at least in cultural way. Such tendencies must be reflected in every culture. Translation acts as a linguistic bridge

among cultures which makes it vital for translation processes to be morally, ethically, and socially acceptable without crossing the barrier of cultural disputes.

Localization limitations are parts of cultural transformation ineffectiveness of artificial intelligence. As was discussed previously, AI struggles to connect similar concepts and ideas that have different manifestations in diverse societies and ethnic groups. The problem itself creates a need for increasing databases capacities for intercultural themes and developing the AI's possibility in building connections more precisely instead of referring only to most commonly used data. This problem also leads to consideration of another issue with artificial intelligence and its functionality – *overdependence on existing databases*. AI does not have a function coded into it to make its translations original, picturesque or unique from others. They pursue the only goal of performing the translation as quickly as possible to satisfy the needs of the user, which sometimes implies sacrificing quality over quantity. **[26, 95-121]**

In conclusion, artificial intelligence in the sphere of translation possesses duality which brings both strengths and weaknesses. On one hand, AI grants its users with high speed, effectiveness, availability and general accessibility which alter the course of human interactions and communication. Moreover, AI has been succeeding in surpassing human capabilities in numerous spheres. According to the research conducted by an independent resource Carnegie, artificial technologies show great signs of superiority over humans in a variety of monitored fields. **[15, 21]**

Capability	**Dataset/Challenge**	**Year Established**	**Year of AI Surpassing Human Performance**
Image recognition	Large Scale ImageNet Recognition Challenge	2010	2015
Speech recognition	Switchboard Hub 5'00	2000	2017
Resolving basic language ambiguities	Winograd Schema Challenge and WinoGrande	2010, with developments introduced in 2016 and 2019	2022

Table 1: Progress on Basic AI Capabilities

On the other hand, it lacks emotional and contextual background, perceives languages in dry and solely practical manner and refrains from considering diversities different languages carry. Overall, the use of artificial intelligence in translation and interpretation requires careful consideration and thorough control as the strengths can potentially be neglected while weaknesses – ignored, which can lead to unfavorable misunderstandings and differences in connotations. **[25]**

Conclusions for Chapter 2

To summarize the scale of cultural significance of artificial intelligence in human society it is important to understand the comprehensive engagement of the discussed technologies in most of the spheres of people's existence. AI totally occupied the sphere of entertainment where music, movies and digital applications cannot exist and develop without the implementation of computerized approaches. Human society connected itself with artificial intelligence to the level where further abstraction or rejection of such technologies in order to preserve natural and ethical essence is futile. The entirety of modern communication processes is structured around AI usage and omission of such assets would be a step back in terms of adequate technological progression.

Besides overall ambiguous impact over people in generalized spheres like culture, AI, robots and computers directly affect job markets, education spheres and languages. Neural networks reshape the structure of many professional areas forcing people into adaptation to new realia. And while manufacturing has been influenced by robots for decades, current tendencies of AI replacing real workforce in mathematics, science, IT and social structures raises significant difficulties and concerns.

Speaking of difficulties, artificial intelligence usage holds a number of issues and inaccuracies by itself. Besides positive factors like higher adaptability and availability, cost-effectiveness and higher speed of task completion, negative aspects that include limitations in emotional and cultural awareness, lack of stylistic, emotional and contextual proficiency and absence of originality exist and nullify the benefits brought by above-mentioned advantages. AI has the strengths to boast about, and its use simplifies the search for solutions for economic, societal and linguistic

struggles across the world. However, excessive use of neural networks and artificial models, especially in communication sphere, can lead to over-reliance on given technologies, deskilling of currently demanded specialties and degradation of essential hard and soft skills efficiency on the level of generation.

Artificial intelligence possesses monumental potential in restructuring the world we know now, turning it into an ideal and sophisticated place, perfectly suitable for self-development and professional growth. The world in which people coexist with machines and, instead of letting them rule over society, use them in a balanced way as overly educated assistants and adversaries. At the same time, AI usage bears the mark of destruction of a thousand-year-long path of absorbing knowledge and passing experience. Artificial intelligence, unless properly managed, can force people into actual ineptitude in which the only way of solving common problems would be resorting to computers and global networks.

The dilemma exists in translation sphere too. On one hand, it is reckless to divert from advanced technologies that simplify routine processes in translation and allow for possibilities of global continuous communication network without limitation. On the other hand, such simplification can lead to the erasure of differences between languages of the world which will have negative impact on cultural identity and sovereignty. The most important action to be taken in controlling the capabilities of AI in translation is monitoring and understanding the role of each translation tool being used.

CHAPTER 3. MODERN STATE OF TRANSLATION AND INTERPRETATION. OVERWHELMING APPLICATION OF AI AND PROBLEMS IT BRINGS

3.1. AI Integration in the Modern Translation Industry: CAT Tools, NMT, LLMs

Upon implementation of artificial intelligence into modern sphere of translation, workers turn to a variety of different tools that carry a specific value in handling with different complexity and specificity of translation tasks. Variety of available tools grants workers the ability to effectively organize their work while maximizing time management and efficiency. Among the most prominent modern translation tools are:

- *CAT tool (Computer-Assisted Translation)*
- *NMT (Neural Machine Translation)*
- *LLM (Large Language Model)*
- *MTPE (Machine Translation Post-Editing)*

Computer-Assisted Translation tools, as those from which computer-based translation originates, are software that assists human translators by providing translation memories as well as terminology management, segment editors, and integration with MT engines. Neural Machine Translation uses specific neural networks thanks to which the translation of full sentences with preservation of contexts and a more fluent and context-aware output is possible. Meanwhile, Large Language Models are exceptionally large neural models trained on diverse text that can perform translation among a variety of other language tasks and are most fit for finding correlations between meanings in different given languages. Lastly, Machine

Translation Post-Editing mechanisms ensure easier process of editing machine translation output to reach required quality levels and clarity parameters. **[1, p. 2759–2765; 24]**

Translation industry of today has simultaneously undergone rapid transformation and adapted drastically due to the integration of Artificial Intelligence across all major stages of the translation and interpretation workflow, which indicates the growing demand for translation potency and inability of real workers to cover such needs. The global language services market reached US$ 71.7 billion in 2024 and is projected to grow to US$ 75.7 billion in 2025, reflecting sustained demand for multilingual communication despite automation trends. Machine Translation (MT), particularly Neural Machine Translation (NMT), has become a core driver of this expansion. The MT market alone accounted for ~US$ 1.9 billion in 2024 and is forecasted to reach ~US$ 2.28 billion in 2025, with a strong compound annual growth rate (CAGR) of 16.6% through 2029. **[10]**

Market/Industry	**Value/Percentage of Implementation**
Global language services industry size	US$ 71.7B in 2024; projected US$ 75.7B in 2025
MT market size (2024 → 2025)	~US$ 1.9B → ~US$ 2.28B
MT market CAGR (2024–2029)	~16.6%
CAT-tool adoption rate	~88% of users implement at least one CAT tool
Enterprise MT provider adoption	DeepL 82%, Google 46%, Microsoft 32%, Amazon 17%

Table 1: AI Integration in Translation Industry

Computer-Assisted Translation (CAT) tools, which function as a basis and foundation of modern-day translation techniques, keep the prominent level of importance in this sphere with approximately 88% of translators using at least one CAT tool in their daily tasks' completion. These tools now integrate NMT engines

directly into translation memory systems which enables the proper comparison with human-generated translations, MT suggestions, and previous segments. On the enterprise level, NMT adoption is widespread: DeepL is used by 82% of language service providers (LSPs), followed by Google Translate (46%), Microsoft Translator (32%), and Amazon Translate (17%). **[2, p. 37-39]**

Tools usage specificity	**Percentage of use**
% translators using ≥1 CAT tool	~88%
% of translators using CAT tools frequently	~59%
CAT tool ecosystem: multiple tools per translator	~76–92%
Popular MT used by LSCs	DeepL - 82%**;** Google - 46%; Microsoft 32%; Amazon 17%
Presence of MT inside CAT tools	Most major CAT tools embed MT APIs and are adding LLM features

Table 2 — Adoption & tools usage rates

Recent advances in Large Language Models (LLMs) such as GPT-4, Gemini, Claude, and Llama have generated a new paradigm for translation — one that combines traditional NMT architecture with context-aware reasoning. Large Language Models allow for improved cultural nuance and domain-specific terminology adaptation with omitting the essentiality of skilful handling of low-resource languages. **[14]**

Nevertheless, human oversight and thorough checking remain fundamental in AI tools functionality due to persistent risks of stylistic inconsistency, bias occurrence, and tone inaccuracies. The lack of control over AI functionality even for the most developed could result in overall meaning distortion, data unclarity and misuse and lack of transparency in the given text. Human readiness to correct

mistakes and artificial intelligence availability must cooperate so that the most precise and clear translation is produced.

3.2. Typical Errors and Limitations of AI-Generated Translations

Even though machine translation systems have become far more sophisticated in recent years, they continue to encounter several recurring difficulties. One of the most noticeable issues is connected to figurative language and everyday expressions for which metaphor or cultural understanding is essential. Phrases such as “to break the ice,” “to hit the nail on the head,” or “to be on thin ice” are still often rendered too literally. The result of such translations being conducted into different languages like Ukrainian, German, or Japanese is that the tone, instead of being preserved, keeping the original connotation, mutates into nonsensical, overly formal, and unreliable piece of text. Another widespread challenge involves words that shift meaning depending on context. For instance, the English verb “to hold” may mean “to carry,” “to organize,” or even “to believe,” depending on the sentence (“hold a meeting,” “hold a baby,” “hold a view”). MT systems may select the wrong equivalent when the context is subtle, producing translations that are grammatically correct but logically inaccurate. A similar issue arises with short particles such as “off,” “set,” or “run,” the usage of which as parts of phrasal verbs changes their meaning entirely. **[47, p.2-7]**

Another layer of complexity lays is cultural fluctuations. While AI manages direct and factual descriptions well, it often misinterprets culturally loaded phrases and concepts like holidays, traditions, or regional nuances. For example, the Indian festival name “Raksha Bandhan” is commonly translated by machines as “the bond of protection.” Such translation fails to capture the emotional, familial, and social significance of this holiday and its groundation in Indian culture. In the same way, Japanese terms like “間違いない (machigainai)” or “お疲れ様です (otsukaresama desu)” tend to be flattened into simple English phrases such as “surely” or “thank you for your work,” which does not showcase their unique cultural nuance in terms of Japanese politeness and social behaviour. **[38, p.2-7]**

Evidently, artificial intelligence requires attentive and thorough improvement in terms of translation clarity and preciseness, as it struggles with managing material from diverse cultures. AI possesses limitations that derogate achievements of human translators and their hard work. A clear example of the limitations of AI translation comes from Elemar de Souza Cruz, a British Brazilian Content Localisation & Community Manager. She observed: “When translating educational material with dialogues between children, I noticed AI turned children’s names into random English words, even translating Hareem as ‘here’. It shows how cultural nuance can get lost in translation.” Chloe Barton (localization project leader, Version Internationale) highlighted some real-life near misses shared by localization experts (Version Internationale and Stoquart): "We were translating for a database company, and the AI came up with something outstanding: it rendered “handle unforeseen test expression values” as “gérer les valeurs de testiculation imprévues” (literally: “handle unforeseen testiculation values”)! In a technical training project, the MT failed significantly: the English sentence was “the customer will receive the check in four to six weeks,” but the French output was “le client ou la cliente recevra le chèque dans un lait de quatre à six semaines” (literally: “in a milk of four to six weeks”). In the terms and conditions for purchasing a subscription after a trial period, “Am I going to be charged after the trial?” has been translated into French as: “Serai-je inculpé après le procès?”, which in English means that the customer will be legally charged in court."

Certain linguistic structures also expose the limits of AI. These include:

- *inconsistent or incorrect gender agreement in languages like German, Spanish, or Arabic.*

- *problems distinguishing formal and informal pronouns, especially in languages with multiple registers (Spanish tú/usted, German du/Sie, Korean 존댓말/반말).*

- *translations that feel stylistically monotonous, particularly in creative texts.*

- *difficulty conveying emotional intensity, irony, sarcasm, or subtle humour.*

- *uneven terminology usage in long documents, where AI may shift terms mid-text or contradict earlier translations.*

As it was mentioned above, artificial intelligence cannot authoritatively evaluate cultural impact and peculiarities of human languages. Such incapacity leads to gruesome mistakes that can affect entire comprehension of the given extract.

Most common errors typology:

- *Lexical errors: wrong word choice, mistranslation of polysemous words.*
- *Morphosyntactic errors: agreement, tense/aspect errors.*
- *Fluency/grammar: ungrammatical output, awkward phrasing.*
- *Terminology inconsistency: inconsistent use of domain terms.*
- *Pragmatic/cultural errors: idioms, register, politeness, cultural references.*
- *Omission/addition: missing content or hallucinated additions (common with LLM outputs).*

Firstly, terminology drift, when AI substitutes approved terminology with stylistic variants, undermining consistency in regulated communication. For example, “sterile barrier system” becomes “sterile protective layer”; “in vitro diagnostic device (IVD)” turns into “test performed outside the body”; automotive “drive torque” shift into “rotational force”.

Secondly, contextual misinterpretation with the translation models selecting an incorrect meaning for a polysemous term due to insufficient domain awareness. The examples are as follows: "lead" translated as the "metal" instead of an electrical cable; discharge being interpreted as “firing an employee” in a medical context; resistance rendered as “opposition” instead of the electrical unit.

Thirdly, omission and addition errors. In this case, AI unintentionally removes or invents information while attempting to increase fluency. Missing warnings such as “Do not reuse”, added explanations that were not present in the original manual and instructions that are aimed at agreeing with the user instead of bringing purpose.

Next, numerical and unit errors. AI is programmed to operate on words, which means numbers and calculations are the topic which forces machine translation systems to go into pure guessing scheme. Such condition ensures the existence of

mistakes like mismanaging decimal points (1.0 mg → 10 mg) and torque values being altered due to formatting (e.g., 35 Nm misrendered as 3.5 Nm)

Regulatory phrase inaccuracy is the topic which, above all, touches the sphere of legal services. AI inconsistently renders legally defined expressions required by specific jurisdictions. It alters an FDA-approved phrase such as “adverse reactions may occur”, misinterprets “contraindications” as “restrictions” and rewrites EU MDR definitions instead of reproducing them verbatim.

Procedural sequence errors are caused by AI's inability to perceive information and cause and effect relationship like people do. The results of this are devastating for instructions continuity, chapters and stages swap and problems in giving concise directives.

Ambiguity and imprecision present the outputs that may contain vague or general descriptions where precise technical language is required or, vice versa, retain a highly official or strict tone in those situations where a more picturesque description is appropriated. For example: “apply pressure” without specifying the value; “secure the device” without indicating which component; ambiguous placement like “install the cover above the unit”.

After that, structural and metadata errors which include formatting, layout, and structural tags disruptions during translation like XML/DITA tags broken or shifted or mistakes like misaligned tables or missing header rows. Also, more specific and technical aspects like corrupted UI strings or lost reference numbers in software localization must be included here. **[47, 49]**

Finally, critical hallucinations which are considered the most severe among common mistakes AI mechanisms make due to the complete inaccuracy of facts presented by computers. Machines fabricate details which absent in the source text, posing significant safety and compliance risks. For example, AI invents clinical benefits of a medication, adds mechanical specifications that were never provided by the manufacturer, completely misdirects the user by presenting them with recommendations for a different product or refers to unreliable sources as a source of advice.

Overall, however, automated metrics (BLEU, chrF) correlate imperfectly with human judgment with human annotation (DQF-MQM, task-oriented measures) remaining vital. At the same time, errors, and inaccuracies mostly cluster around pragmatic, cultural and terminological mistakes - the areas unwanted mistakes in which lead to disruption of communication processes.

3.3. Human–AI Collaboration: Post-Editing, Quality Assurance, and the Future Role of Translators

The occurring role of human experts in the field of professional translation and interpretation changes and adapts accordingly with the appearance and enhancement of AI-infused technologies. Most businesses and corporations employ neural systems for performing complex linguistic transformation tasks. At the same time, the role of real works changes from the direct responsibility of translation conduction into quality-control of computerized systems and sustaining of their functionality. This shift, while significantly decreasing the role of people in specific kinds of translation, creates new forms of specialization such as light post-editing, the main function of which is to ensure basic comprehensibility and professional and literal acceptance of the material covered and full post-editing which monitors and edit the production of publication-level quality abstracts. **[50, p.319-335]**

Reported productivity gains from MTPE are substantial but variable (typical industry/academic range ~20–50% depending on use case and post-editing guidelines). **[36]**

Source	Topic	Reported result
Industry handbooks & reviews	Productivity uplift	Post-editing can improve productivity vs translating from scratch; numeric uplift varies widely (commonly reported ~20–50% depending on MT quality & domain)

POEditor summary / surveys	Translators' perception	Majority report productivity increase (~30% +) when using CAT+MT; adoption increasing
Empirical studies / journal articles	Cognitive load & error patterns	Post-editing reduces production time but may increase cognitive monitoring; quality depends on PE guidelines and MT quality.

Table 3 — Post-editing productivity & quality

Quality assurance (QA) also increasingly relies on hybrid systems as automated terminology checks, quality estimation metrics, and error detection tools complement human expertise and ability to notice nuances and effectively eliminate potential dangers. Moreover, while AI can operate without human interference in strictly specific fields, human judgment remains essential for ensuring contextual accuracy, cultural appropriateness, stylistic coherence, and adherence to client preferences, as AI faces difficulties comprehending these aspects of work. User experience establishment is another field where humans' influence is reduced to monitoring computers' activity. Furthermore, industry is adding adaptive query execution to reduce human effort and route segments to translators efficiently. **[4]**

Practice	**Purpose**
MT + human post-editing (MTPE)	Scale content localization while keeping acceptable quality
Automated Quality Estimation (AQE) & MTQE	Triage segments for post-editing / decide translate-from-scratch vs post-edit
Domain-specific custom engines / glossaries	Improve terminology consistency and reduce perceived effort

Table 4 — Industry practice of human – AI collaboration

MT and AI-driven translation market continue to grow non-stop. Forecasts from various specialties and researchers predict the MT market expanding by US$ 1.4986 billion between 2025 and 2029 and translation management platforms growing by USD 2.33 billion by 2028. With this mind, future changes, when the role of humans in translation shifts to curation, observation, coding and digital engineering as forms of aid to AI, are foreseeable. **[29-33]**

However, human translators are required to pay close attention to the activity of MT mechanisms. Without human intervention, artificial intelligence faces difficulties in overseeing cross-language translation with leads to reputational risks for big international hegemons and companies. Some of the obvious examples are:

KFC & Latin America: An AI translated "Grill with confidence" as "Asa con confianza", which, while grammatically correct, sounded like a rigid command rather than persuasive marketing text. A more natural phrasing would be "Disfruta de la parrilla con confianza".

Mercedes-Benz "Experience the Drive": AI rendered it into German as "Erleben Sie die Fahrt", technically correct but bland. A human would choose "Freude am Fahren erleben" to capture the brand tone.

Software "seamless integration": AI translated into French "Intégration sans couture" ("without sewing"), nonsensical (correct would be "intégration fluide" or "harmonieuse").

Powerade in Japanese: AI translated "Power water" as "Chikara Mizu" (literally "Forceful water"), inadvertently implying aggression instead of energy boost.

Ford's Arabic advertisement: AI translated "high-quality body (of the car)" as "الجودة عالية جثة" (which means "high-quality corpse"), causing a nightmarish mistranslation. A qualified human would use "هيكل" (vehicle structure) instead of "جثة".

Facebook auto-caption case: A benign Arabic greeting translated by AI into Hebrew and English as “attack them” or “hurt them,” leading to false arrest incidents in Israel (a dramatic illustration of AI’s contextual failure).

Ray Dalio speech subtitles: AI mistranslated phrases like “How arrogant! How could I be so arrogant?” into nonsensical output (“How? Aragon…”) due to voice-to-text errors and poor contextual understanding. **[40]**

These and many other examples of AI incompetence showcase the current importance of human translators in ensuring stable and faultless flow of information given by artificial intelligence. At the same time, humans cannot rival MT systems in speed, which means that the only way to stay in position is to adapt to the role of an active observer.

In other words, competition with artificial intelligence is undesirable. Instead, translators should increase their efficiency in the roles of editors, consultants, and domain specialists, ensuring professional and ethical standards upkeep within the product delivered by AI. Human creativity, cultural intelligence, and domain expertise remain irreplaceable components of high-quality translation.

3.4. Prospects for AI in Translation and its Impact on Global Communication

Humanity has gone a long from performing first ever translations and interpretations to allowing its creations, robots, and computers, to manage even the most complex linguistic task. People always try to find the most sophisticated ways to simplify the actions the must take and artificial intelligence exploitation in translation field is the example of such activity. And to fully automize all processes, the integration of neural systems into various fields of work, including translation will grow exponentially.

The integration of AI systems into the translation market is expected to significantly reshape global communication dynamics. According to Nimdzi (2025), the language services industry is projected to reach US$ 92.3 billion by 2029. Such rapid increase is caused by rising demand for cross-cultural communication in business, diplomacy, healthcare, digital media, education, and entertainment.

Considering the scale of development and scalability of NMT and LLM tools and models, artificial intelligence will enter a multi-cultural level of proficiency which will cause not just individual countries but entire economies and regions to adapt accordingly. **[41, p.12-29]**

AI may particularly benefit low-resource and endangered languages by enabling basic communication models that were previously unavailable due to limited data. As AI-generated translation becomes increasingly more widespread, linguistic diversity and cultural nuance become its top priorities which, however, cannot yet be enforced without humans' careful consideration and approval.

Basic MT machines face insurmountable challenges in sequencing, continuity and interpretation of ideas. The following two texts are generated(English) and translated(Ukrainian) by AI completely:

"Although Mark had prepared for the meeting, he still felt a bit on edge. The new software update was supposed to "make things easier," but instead it caused more confusion for the entire team. When Sarah said they needed to "get the ball rolling," Mark wasn't even sure where to start. On top of that, the client kept changing their requirements at the last minute, which only added fuel to the fire. Despite the stress, Mark tried to keep a cool head and assured everyone that they would sort things out by the end of the day."

"Хоча Марк підготувався до зустрічі, він все ще відчував себе трохи на краю. Нове оновлення програмного забезпечення повинно було "зробити речі легше", але замість цього воно викликало більше плутанини для всієї команди. Коли Сара сказала, що їм потрібно "зрушити м'яч", Марк навіть не був впевнений, з чого почати. До того ж, клієнт продовжував змінювати свої вимоги в останню хвилину, що тільки додало палива до вогню. Незважаючи на стрес, Марк намагався тримати холодну голову і запевнив всіх, що вони розсортують речі до кінця дня."

The Ukrainian translation shows several issues typical of machine-generated output with many idioms being misinterpreted or rendered literally, which distorts or completely loses their intended meaning and impact. For example, on edge becomes «на краю», suggesting a physical location rather than emotional tension. Get the ball rolling turns into «зрушити м'яч», which cannot convey the real meaning of starting and action. Similar literalism appears in phrases like added fuel to the fire, keep a cool head, and sort things out, the last of which is mistranslated as physically sorting objects.

Moreover, the text also displays awkward phrasing and stylistic inconsistencies with unnatural collocations, word-for-word choices, and a mix of formal and informal tones. The main problem with the extract is that it does not feel like if it was naturally written or created by a Ukrainian speaker - the absence of emotionality is obvious. Altogether, these errors illustrate how AI systems can produce translations that, even though are grammatically acceptable, remain contextually inaccurate or misleading. These factors are significant in managing the proper understanding of a material that is rendered into source language.

However, in the long term, translation is likely to become a collaborative process between AI systems and human professionals in which managing routine segments and ensuring accuracy, intent, and cultural meaning will be overseen together by AI and real specialists, respectively. The challenge for global communication lies in balancing efficiency with authenticity — we must ensure that accelerated translation does not diminish the depth, eliminates diversity, or neglects cultural specificity of human languages. **[51]**

Conclusions for Chapter 3

AI translation and interpretation technology and methods are slowly but surely not just entering but conquering the sphere, which was meant to be solely ruled by human specialists and understanding. As it being clear from the data gathered, tools and application the root of which lies in algorithm-based operation and functioning over text, connotations and expressions dominate the field where precise and fast provision of result is essential for the satisfaction of its direct users' needs.

Chapter 3 has examined the multifaceted relationship between artificial intelligence and translation. Here, the technical mechanisms behind modern systems and the practical challenges that arise in real-world use of it were outlined and determined by the author. The assumption was reached that AI-driven translation tools have progressed to an unprecedented level of fluency and accessibility, while their performance remains uneven and it heavily depends on human factors like linguistic context, genre, and cultural specificity.

At the same time, the discussion highlighted that MT and LLM-based systems excel at a range of factors from handling standard and repetitive to structurally predictable texts that are easy to oversimplify. However, they continue to struggle with the nuances that differentiate natural human communication from computerized one. Moreover, this chapter exposes the limitations of AI models, which acts as a reminder that translation is not a purely mechanical process but a deeply interpretive one.

Furthermore, the before mentioned challenges artificial intelligence demonstrates struggles with underline that even the most advanced systems are far from replacing the need for human expertise. What should be done by the professionals around the world is the acceptance of the current role AI serves best at - being a powerful support tool under careful human observation that can accelerate workflow, reduce routine workloads, and enhance productivity.

To finalize, the chapter underscores a central idea: AI translation is a rapidly evolving technology. Nevertheless, it is the piece of technology that must be complemented by human judgment to reach its full potential. Neural systems and machine translation innovations continue to improve and the collaboration between human translators and AI tools will become the defining model for high-quality translation in the years ahead.

Artificial intelligence is the invention of the existential importance that stands on the same layer of humanity’s genius as wheel, electricity, and the Internet. All these technological breakthroughs pushed the civilizations forward and AI is not an exception. These models have already outperformed any possible human counterparts

our society can present with their impact spreading all over the world and changing the lives of millions of people. In order to increase the positive influence of artificial intelligence and its coexisting technologies, people must find ways to sustain them and find ways to properly control its development, which is the only possible way for a bright future of balanced coexistence in our constantly developing world.

CONCLUSIONS

Human curiosity and strive for perfectionism are unmatched. We are the only creatures that have stepped feet in this world and managed to overcome its cataclysms and subdue its powers for our own benefit. Every achievement and progress, every cultural and technological evolution would be impossible without humanity's abilities to compromise, communicate, and collaborate. At the same time. All these processes and results they lead to are impossible without the extensive language use and the capabilities of human brain that enabled the evolution of linguistic precedents around the globe.

Language, as a matter of communication was not the first way people used to exchange information. Prior to verbal communication, humanity relied on signs, mimic, gestures, actions and drawing as methods to convey information and suggest ideas. These ways allowed for basic information exchange and established the foundation of human elaborative nature. However, their influence over the course of history and establishment of the modern concepts that today seem to be mundane cannot be compared to language and its use.

The usage of language and verbal communication are the key reasons why science, culture, religion, and dozens of social institutions exist today. Yet as language expanded in complexity and sophistication, it also revealed one of humanity's most persistent challenges: the need to communicate across linguistic boundaries. As soon as communities grew, migrated, traded, warred, and shared ideas, the diversity of languages became both a treasure and an obstacle. That is why the people who possessed the skills of establishing communication between two oblivious sides became vital. Early-day translators and interpreters functioned as bridges between cultures and allowed for a much more productive collaboration. Translation became an indispensable instrument in every sphere of human life, the existence of which allowed ancient civilizations to exchange scientific discoveries and enabled religions to cross continents. It also established and helped to preserve philosophies that found space in people's hearts and minds and later opened pathways for diplomacy, literature, and global trade. Without translation, many of the world's most influential ideas would have remained locked within the borders of the cultures that created them without the possibility to see the light of the place they were meant to enrich.

Over time, translation methods evolved in response to humanity's growing needs. Each era of translation techniques and methods refined the craft altogether. Translation and interpretation, as independent spheres, crossed the long way of evolution from paper-based written translation and purely improvised speeches to printed press and radio usage. Finally, translation turned into the aspect of our society that reshaped diplomacy, governance, and surveillance. The peak of development started twentieth century which introduced systematic linguistic theories and practical models as crucial attempts to standardize translation principles, making the field more academically grounded. But the true shift began when machines displayed greater abilities than humans had.

Early attempts at machine translation were modest and rigid, often producing unusable results. Gradually, rule-based systems gave way to statistical models, which were later surpassed by neural networks and large language models. Nowadays, the

capabilities of AI-based translation tools are not limited by the number of items and can process vast amounts of text in seconds while detecting patterns beyond human capacity. AI-based tools offer immediate access to multilingual information, and they become woven into everyday life—from navigating websites and communicating online to supporting global business and education.

The cultural impact of AI translation on society is profound and cannot be unnoticeable. On one hand, the implementation of AI translation tools democratizes knowledge and reduces language barriers existing in our society. They also give individuals unprecedented access to information regardless of linguistic background while simultaneously reshaping global markets by accelerating international communication and enabling small businesses to reach audiences of maximum grasp. In many ways, AI translation is redefining how cultures interact in a digitalized world. It offers speed, accessibility, and consistency, making it a powerful tool when paired with human expertise rather than used in isolation.

On the other hand, AI also brings challenges and problems that lead to investigations and experiments over its readiness of working as complete assistants for humans. Once again, automated systems struggle with cultural meanings, humour, emotions, and historical context, while most professional human translators can detect such elements instantly and navigate them intuitively. There is the risk of flattening cultural specificity, of simplifying rich traditions into literal approximations. Ethical concerns emerge as well - AI usage increases the potential for undesirable misinformation, bias embedded in training data, and the erosion of professional opportunities for human translators.

Today, AI stands at a transitional point of turning our society from being vastly developed to a transcending mechanism where every process works without malfunctioning and digitalization assists people instead of taking their roles and professions. Artificial intelligence of today is remarkably capable available in different spheres, but its reliance and ambiguity must be analysed and enhanced. Technological progress never stops and continues to develop, so the future that awaits will involve deeper integration of artificial intelligence into not just translation but

daily communication and routine. The appearance of stronger collaborative models where human translators guide and elevate machine output are within expectations for the nearest future. The prospects of AI usage are promising but the balance between rejection and overuse must be mounted.

In the end, the story of translation mirrors the story of humanity itself - it is a continuous struggle and abundance of costly attempts to understand one another and to connect across borders. The introduction of artificial intelligence systems creates the possibility to eliminate all differences while preserving the cultural and linguistic diversity. The world that AI usage presents us is the place where humanity rules the world of balance alongside its computerized assistant, which has the potential to become its most revolutionary creation.

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