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У збірнику подано статті іноземними мовами з викладенням результатів наукових досліджень студентів, аспірантів та молодих науковців у різних галузях, що можуть зацікавити світову наукову спільноту. Регулярні публікації робіт допоможуть виявити талановиту студентську молодь, здатну брати участь у міжнародному професійному, науковому та освітньому обміні та втілювати одержаний досвід у розвиток передових технологій.

Усі матеріали публікуються в авторській редакції.

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HUMANITIES

Ananko I. Y.

PSYCHOLOGY OF COLOR IN THE ASPECT OF ACTIVITY

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Color is, primarily, a physical phenomenon. In science, color is understood as a characteristic of electromagnetic radiation of a specific optical range – the spectrum. Color perception arises based on the sensations of the visual apparatus. That is, color is a visual sensation that a person receives when light rays of different wavelengths enter the eye. Color perception is a very subjective characteristic. It turns out that each person sees colors in their own way.

The phenomenon of color perception and the features of the interaction of the human organism with color have long interested researchers. Color is vitally important for people of very many professions where it is necessary to take into account the psychological reaction of a person to color. Color perceived by a person purely visually also affects their other senses. Thus, for example, sharp acoustic stimuli can be muffled by corresponding color stimuli. Sharp, screaming noises will be perceived more calmly in a room painted in olive-green, gray-green, marsh-green, or dark brown colors. Dull rumbling noises in a room can be leveled by its yellowish coloring.

Let us characterize human perception of primary colors and their influence on his activity.

Red color personifies power, the will to win, a source of energy. The motto of this color is "let the strongest survive". In a restaurant under the influence of red color, visitors eat hurriedly and leave quickly. Red color increases labor productivity for a short time, and then reduces it.

Walls of orange color with a brown tint induce sleep and cause depression.

Pink calms, relieves obsessive thoughts, helps in a crisis. But it is characterized by excessive sensitivity. Pale pink is desirable to use in a bedroom, a relaxation room; under its influence, it is easier to get up in the morning. It evokes coziness and comfort.

Blue color is constancy, tenacity, perseverance, devotion, selflessness, seriousness, rigor. Also, blue color is a loss of reality, dreaming, fanaticism. Blue causes serene peace. It is preferable for meeting rooms, as it promotes organization, but is negative for children's rooms, as it causes melancholy. Light blue (azure) is the color of carelessness, carefree fun. It soothes, radiates reliability, but at the same time, looking at it, it is impossible to concentrate. It does not contribute to the development of imagination. Pale azure is positive in the bathroom, in the bedroom. It also helps to restrain emotions.

Yellow color expresses versatility, virtuosity, diversity, searches, hopes, ardor. It personifies intelligence, influence. It is the most flexible, penetrates everywhere, helps to overcome difficulties, promotes concentration of attention (therefore it is desirable to take exams in a yellow room). It excites motor skills, stimulates creativity, alternating relaxation and tension; stimulates brain work and vision. This color is preferable in an airplane cabin and kitchen. Red-yellow excites appetite, especially in combination with pastel green. Prevents the growth of irritation.

Green color comes from the fusion of blue and yellow, while the qualities of both complement each other. Hence appear peace and immobility. Absolute green is the calmest color existing. Pure green is absolutely conservative. It expresses self-regulation and self-esteem. The motto of this color: "Noblesse oblige". Green symbolizes prosperity and new beginnings, it soothes, balances. Green neutralizes the action of primary colors, helps to dissipate negative emotions, helps to concentrate and make a decision. Dark green color is positive in non-residential rooms, in a library, that is, where a lot of time is spent. Blue-green (turquoise): the coldest of all shades. For this reason, it is most appropriate to use it where it is

necessary to optically create refreshing coolness. It is desirable in hot countries, in hot factory workshops, in rooms with a stuffy and heavy smell.

Violet color is formed by red and blue, which extinguish each other. Violet is the heaviest color, durable, massive, deep, retreating, passive, depressing. It darkens, induces slight sadness, deprives of will, makes uncertain. It must be diluted with gold, otherwise it can lead to depression. Violet is not recommended in work with children.

Brown is a darkened yellow-red. Brown color personifies stability, devotion; it is all on the surface. When applying for a job, it has a positive effect. Brown creates coziness but pulls to rest, so it cannot be used in a library, but it is good to use in court as the color of immutability.

Cream has a soft effect, expands space, facilitates the perception of reality, gives confidence that everything will be fine.

White color is characterized by perfection and completeness as the final point of brightness, demonstrates an absolute and final decision, complete freedom for opportunities and removal of obstacles. White color suppresses irritation but tires. It constricts pupils, sharpens sensations. White color is perceived as the color of absolute purity and, being considered a symbol of something spiritual and abstract, visually means "emptiness". Consequently, it is necessary to "enliven" this color by all means. White color can be applicable only when, for the purpose of neutralizing contrast, it is located between two "aggressive tones" or when some surface is decorated with its help, which should specifically attract attention. In a room, especially with poor lighting, ceilings and walls painted in white color usually seem somewhat gray. This cold coloring does not create the impression of a bright room. From a psychological point of view, painting a production room in white color tires and affects workers unfavorably.

Gray color combines the opposite qualities of black and white. Gray is neutrality. Gray color always stabilizes processes around. This color gives strength

to someone who is weak and vulnerable. Clothing makes it possible to be free and soothes nerves well. Light gray expresses readiness for contacts.

Regarding the selection of paints for color design of the workplace, it is desirable to remember the following. A workplace painted in a gray gloomy color causes negative emotions in a worker, and conversely, painted in cheerful colors, improves his mood. Concentration in work is also achieved by the fact that nothing irritates or tires the eyes of the worker. A green machine tool against the background of a light green or brownish wall forces straining the eyes, increases fatigue, and leads to a decrease in labor productivity.

The exciting influence of certain colors or combinations of colors cannot be the basis for recommending these colors in order to increase labor productivity. Initial excitement will invariably be followed by depression, and ultimately the result will be negative. When designing production premises, one must proceed from the fact that each work process requires a special selection of colors in accordance with the specifics of the given labor. The monotony of the work process in one workshop and the liveliness in another can be balanced by appropriate coloring. Thus, the approach to the color design of a classroom, an administrative room, and work offices should be different.

Color draws its significance from reality, and its impact is determined by a whole sum of factors, which includes the social experience of a person. Red and yellow colors have an exciting effect, so they should be used limitedly, i.e., in rooms where students can stay only for a short time, or where this excitement is necessary, for example, in a sports hall. However, when painting premises and equipment, one should avoid monochromacity, as monotony bores, causing protective inhibition. Rational lighting of halls and workplaces (sufficient illumination, favorable spectrum, uniformity), artistic decoration of the hall interior, beautiful and comfortable form (if introduced in the educational institution) prevents the development of fatigue. Rational coloring of educational premises and equipment can ensure the growth of labor productivity and the efficiency of educational activity.

Vestibules, halls, lounges, and offices become welcoming and cozy when they are enlivened by works of fine art. Artistically executed and skillfully selected by theme paintings are capable of raising mood, making it optimistic, reducing internal tension, relieving fatigue, etc. When selecting paintings, it is necessary to show maximum exactingness to their artistic perfection and carefully take into account the correspondence of their content to certain conditions. Thus, for example, successfully selected and hung still lifes in a dining room can stimulate appetite. However, if they significantly exceed what the dining room menu offers in the abundance and quality of food, this leads to a decrease in appetite. The same negative influence is exerted by paintings placed in offices depicting bloody battles, yearning prisoners in dungeons, dramatic everyday scenes. This must be borne in mind if it is required that the interior decoration meets its purpose.

Thus, it becomes clear how great the influence of color is on human life activity, on his physical and mental state. With the correct use of color shades and combinations, it is possible to create more favorable conditions for work and increase labor productivity.

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Bakshy-Sarach V. R.

SYNONYMY IN MODERN IT TERMINOLOGY: TRANSLATION AND UNIFICATION CHALLENGES

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In the modern globalized world, Information Technology (IT) acts as a primary driver of innovation, reshaping communication, business, and daily life. As the industry expands, so does its language. IT terminology has evolved into one of the most dynamic lexical systems, characterized by an explosive rate of neologism formation. English, serving as the lingua franca of the digital age, is the source of the vast majority of these new terms, which are subsequently borrowed, calqued, or translated into other languages, including Ukrainian.

However, the unprecedented speed of innovation often outpaces the natural processes of terminological selection and standardization. This leads to a linguistic paradox: while classical terminology theory postulates that an ideal term should be monosemantic, systematic, and free of synonyms, the reality of IT discourse is characterized by widespread terminological synonymy. The simultaneous existence of terms like bug, defect, issue, error, and fault to describe similar concepts creates significant hurdles for translators and localizers.

This paper aims to investigate the nature and sources of synonymy in English IT terminology, classify the types of synonyms relevant to the field, and analyze specific strategies for their adequate translation and unification in the Ukrainian language.

The phenomenon of synonymy in terminology has long been a subject of academic debate. Traditional terminology studies, represented by scholars such as

D. S. Lotte, V. I. Karaban, and A. P. Koval, adhere to the prescriptive view that synonymy (or terminological equivalence) is a negative phenomenon. According to this approach, a term must strive for accuracy and uniqueness within a specific system; therefore, the existence of absolute synonyms (doublets) is considered a flaw that hinders professional communication and unification (Карабан, 2004).

Conversely, modern researchers, such as V. V. Turchin and T. I. Panko, argue that complete elimination of synonymy is impossible, especially in rapidly developing fields like IT. They view synonymy as an objective and inevitable stage in the evolution of a terminological system. In the IT field, synonymy often performs a cognitive function, allowing specialists to highlight different aspects of the same concept.

For this study, we distinguish between three types of synonyms relevant to IT translation:

1. *Absolute Synonyms (Doublets):* Terms that are identical in meaning and interchangeable in all contexts. In IT, these often arise due to competition between different software ecosystems (e.g., log in / sign in).

2. *Ideographic (Partial) Synonyms:* Terms that denote the same concept but differ in shades of meaning, scope, or technical nuance. For instance, while "delete" and "remove" are often translated identically in general language, in specific IT contexts, "delete" implies permanent erasure from storage, whereas "remove" means taking an item out of a list or group without destroying the object itself.

3. *Stylistic Synonyms:* Terms that differ in register, typically opposing official terminology to professional slang or jargon (e.g., repository vs. repo; administrator vs. admin).

Unlike stable scientific fields such as anatomy or chemistry, IT terminology is an open system driven by powerful extralinguistic factors. Our analysis identifies four primary sources of synonymy in this domain.

1. *Parallel Development and Corporate Competition.* Large technology corporations often develop similar functionality simultaneously, but coin proprietary terms to differentiate their products. For example, for user authentication, Microsoft strictly uses the phrasal verb log in, while Google standardized the term sign in. Similarly, in the domain of version control systems, GitHub popularized the term "Pull Request", whereas its competitor, GitLab, uses "Merge Request" for the exact

same operation. For a translator, the choice of the target term often depends not on linguistics but on the specific platform being localized.

2. *Acronyms and Clipping.* The constraints of the graphical user interface (GUI) create a constant need to save screen space. This forces the creation of short forms, which often become independent terms that compete with full forms. User Interface competes with UI, Application Programming Interface with API, and Application with App. In Ukrainian translation, this creates a dilemma: whether to translate the full term (програма) or create a neologism for the short form (застосунок).

3. *Metaphorization.* IT terminology is heavily reliant on metaphors to explain abstract digital concepts through familiar physical objects. This often leads to synonymy when different metaphors are applied to the same object. For example, the concept of a "protective barrier in a network" is universally known as a firewall (a construction metaphor) but can also be referred to as a shield or screen in specific security contexts.

4. *Migration of Professional Slang.* Terms originating in the spoken jargon of developers often migrate into official documentation. The term "bug", originally a slang word referencing a literal insect that causes a short circuit, has become a standard term. However, it now competes with more formal terms, such as error, defect, and fault. In Ukrainian translation, this necessitates a choice between the transliterated slang (баг) and the normative terms (помилка, вада).

The translation of IT synonyms involves a constant negotiation between equivalence (the accuracy of meaning) and adequacy (the communicative effect). Based on the analysis of the Microsoft Ukrainian Style Guide (Microsoft, 2025) and academic dictionaries (Гладун, 2018), we identified the following key challenges:

Semantic Neutralization

English IT terminology is often more granular than Ukrainian, distinguishing between subtle functional shades. A prominent example is the triad settings/options/preferences. In English, settings typically refer to technical or

system-wide configurations, options imply a choice from a list, and preferences refer to user-specific personalization. In Ukrainian localization, these distinctions are frequently neutralized, and all three terms are often translated as "налаштування" (settings) or "параметри" (parameters). This simplification, although linguistically convenient, can result in a loss of functional meaning in complex software interfaces.

Excessive Synonymy in the Target Language

Conversely, a single English term can spawn multiple Ukrainian equivalents due to different translation strategies (transcoding, calquing, description). The term firewall is a prime example. In Ukrainian IT discourse, three synonyms coexist: міжмережевий екран (calque) – the official academic term used in formal standards; брандмауер (borrowing from German) – an older term; and файрвол (transliteration) – the most common term among professionals. This "excessive synonymy" creates inconsistency. A user reading documentation might be confused if the interface uses 'брандмауер' while the help manual refers to 'файрвол'.

The Problem of "False Friends"

The English term correct (e.g., correct password) presents a specific challenge. In general language, it is often translated as вірний (faithful). However, in IT terminology, вірний is considered a gross error ("faithful password" makes no semantic sense). The Microsoft Style Guide explicitly forbids вірний in this context, mandating the use of правильний (right/correct). Nevertheless, вірний пароль remains a widespread error in amateur localization.

The study reveals a significant gap between academic unification and corporate regulation. Academic dictionaries tend to be descriptive, listing all available variants (link – посилання, лінк, зв'язок, гіперпосилання), giving the translator a choice but offering little guidance on usage.

Corporate style guides, on the other hand, are prescriptive in nature. They aim to eliminate synonymy to ensure consistent user experience across products artificially. For example, the Microsoft Ukrainian Style Guide explicitly addresses the synonym pair option/parameter. It forbids the use of the Anglicism "опція"

(option), mandating the use of "параметр" in all contexts to avoid confusion. Similarly, it differentiates between delete (erasing a file – видалити) and remove (taking an item out of a list – вилучити). This prescriptive approach is currently the most effective tool for managing synonymy in software localization.

To conclude, the phenomenon of synonymy in English IT terminology is an objective and inevitable consequence of the rapid development of the industry. It stems from the parallel evolution of technologies, the fierce competition between corporate ecosystems, and the active formation of professional jargon.

For a translator, synonymy poses the challenge of choosing between formal equivalence (precise translation of the term) and functional adequacy (ensuring clarity for the user). The analysis shows that "pure" translation is often insufficient. The most effective strategy involves adherence to major corporate style guides, which serve as the primary instrument for unifying terminology and reducing ambiguity. Future research should focus on the role of automated translation tools and AI in standardizing emerging IT neologisms.

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Buriak D. Y.

THE SPECIFIC FEATURES OF LEGAL TRANSLATION

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Legal translation is the translation of highly specialized legal documents, such as contracts, legislative acts, regulatory texts, and others, into another language without changing their legal meaning or legal force. Such translations may connect common law jurisdictions, including the US, Canada, and Australia, or link them to civil law systems, which exist in France, Switzerland, and most countries of continental Europe. Each system has its own legal "DNA", which makes translation particularly challenging.

The community of translators and linguists focuses on the issue of high-quality translation of business documents, particularly agreements and contracts. This emphasizes the importance of researching approaches to translating agreements and contracts into Ukrainian, as well as studying appropriate translation strategies and transformations necessary for accomplishing this task.

Specific features of legal texts include the use of special legal vocabulary. This includes:

1. legal terms and concepts, e.g., *ademption* – «скасування заповіту» (Бондарчук, 2021);

2. commonly used words that acquire a narrow-specialized meaning within the context of law, e.g., *abuse* – 1) «зловживання»; 2) «образи, нападки»; *abuse at law* – «зловживання в порушення закону» (Бондарчук, 2021);

3. numerous abbreviations typical of the legal sphere, e.g., *IHRR* – *International Human Rights Reports*, *AC – Appeal Cases* (University of Exeter Library Services, 2025);

4. Latin and French loanwords (often without translation), e.g., *sciendum* – запис у діловодстві про видачу судового наказу для виконання; *action ex contractu* – позов з угоди (контракту) (Бондарчук, 2021);

5. archaic words of Old English origin, as well as idioms and phrases that are rarely used in modern literary language.

However, the main challenge for translators is non-equivalent vocabulary. In order to translate correctly, it is necessary to first determine the unit of translation, which may be any linguistic unit – from a phoneme to a supra-phrasal unit – and not just a word. The unit of translation can only be determined from the context, in which a word is systematically related to other words in the text or utterance.

A summarization of various classifications of non-equivalent vocabulary has made it possible to distinguish:

– reference vocabulary, which includes terms, compound words, words with broad semantics, and semantic gaps;

– pragmatic vocabulary, which is represented by foreign language insertions, abbreviations, onomatopoeia;

– alternative vocabulary, which includes proper names and idioms.

During the translation of legal texts, translators mainly encounter the first group of non-equivalent vocabulary – referential vocabulary. One of the techniques for conveying non-equivalent terms is transliteration. Using this technique, translators phonetically reproduce the source lexical unit with the phonemes of the target language, obtaining an imitation of the pronunciation of the source word (Голопич, 2023). For example: *cartel* – 1) «картель, угода між партіями, фракціями»; 2) «картель (об'єднання підприємців)»; *debit* – «дебет» (Бондарчук, 2021).

To translate specific features of one legal system that have no equivalent in another, translators resort to descriptive translation techniques. It should be noted that translating such lexical gaps requires deep knowledge of a specific subject area. For example:

– *default* – 1) «неявка в суд; невиконання в термін процесуальних дій»; 2) «неспроможність боржника; невиконання; неплатіж»; 3) «відсутність, нестача чого-небудь» (Бондарчук, 2021);

– *litispendence* – 1) «знаходження справи в судовому провадженні; незакінчений процес»; 2) «неприпустимість розгляду судом питання, яке вже розглядається іншим судом» (Бондарчук, 2021);

– *inducement* – 1) «вступна частина документа або процесуального паперу»; 2) «спонукаючий фактор, стимул»; 3) «зустрічне задоволення» (Бондарчук, 2021).

The translation of legal terminology is difficult because the source and target languages may be used in multiple legal systems, each of which operates with its own set of legal concepts. Accordingly, when determining the equivalence of legal terms, it is necessary to analyze them across all legal systems in which these terms are used. Basic methods of legal translation include:

– searching for equivalent correspondences;

– description (translation by explaining the general meaning of words);

– transcoding (transferring the sound or graphic form of a term into the alphabet of the target language);

– calquing (literal or direct translation);

– lexical transformations (varying the lexical elements of the translation to adequately convey the semantic, stylistic, and pragmatic features of the target language).

Thus, translating legal terminology in official business communication is an extremely difficult task that requires absolute accuracy, legal clarity, and deep understanding of legal context. Choosing the correct equivalent for a legal term is essential for preventing misunderstandings and ensuring the legal validity of a document.

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Chevychelova A. O.

THE FUTURE OF PHILOLOGY AND LINGUISTICS IN THE AGE OF TECHNOLOGICAL TRANSFORMATION

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The distant future often arrives sooner than expected. For this reason, the development of philology and linguistics in the coming decades remains an important subject of reflection. This field is constantly evolving. New technologies, cultural shifts, and global communication continually reshape how people use and study language. Some questions remain unanswered for years, while others suddenly become important again. This dynamic character makes linguistics a living discipline that evolves together with language itself.

Albert Einstein once stated that he never thought about the future because it comes soon enough. Similarly, the future of linguistics is not always considered in sweeping terms. Nevertheless, it is possible to make educated assumptions, particularly regarding the influence of technology, as technological trends are more predictable than changes in human cognition. Over the past fifty years, computers and, more recently, neuroscience have significantly reshaped linguistic research.

One possible direction of future development is the gradual movement beyond paradigms dominated by computer analogies. For decades, language has been studied as a cognitive algorithm involving a sequence of information processing steps. Metaphors such as “brain as hardware” and “mind as software” have long prevailed. Although these analogies were useful, their explanatory value may decrease over time. Future research may explore alternative paradigms that extend beyond purely computational interpretations of the human mind (Ismayilova, 2025).

The history of linguistics demonstrates that paradigm shifts are always possible. Structuralism once dominated the intellectual landscape and influenced linguistics, sociology, anthropology, and even architecture. Its emphasis on opposition and systemic relationships guided research for decades; however, contemporary approaches to language differ considerably. Such historical transformations suggest that linguistics will continue to evolve in unexpected ways (Jia, 2023).

Several technological breakthroughs are expected to influence linguistics significantly within the next fifty to one hundred years. One of the most important developments is advanced artificial intelligence. Machines may eventually pass the Turing Test and communicate in ways indistinguishable from human interaction. This would have a profound impact on machine translation and automated language understanding. Although artificial intelligence may reduce the economic and practical motivation for certain areas of theoretical linguistics, it will not make the discipline obsolete. Researchers will continue to study how artificial systems process language, gaining insights into both human and machine cognition (Anthony, 2024).

Another important area of advancement is neuroscience. Understanding how the brain processes language at the level of neurons or neuronal clusters could revolutionise knowledge of language acquisition, comprehension, and production. Brain imaging technologies and detailed connectomes may provide explanations for language disorders such as aphasia and dyslexia. These discoveries may also improve language learning and pedagogy by making instruction more efficient and better adapted to individual cognitive profiles (Ismayilova, 2025).

Genetics represents a third significant frontier in language research. As the relationship between genes and behaviour becomes clearer, it may be possible to identify how specific genetic variations influence linguistic abilities, predispositions to disorders, or exceptional language-learning skills. This knowledge could lead to targeted interventions and more effective learning environments.

Despite rapid technological progress, certain aspects of philology will remain constant. Language documentation and revitalisation will continue to be essential, particularly as many languages remain endangered. Even with advanced digital tools, human expertise will remain necessary to record, analyse, and interpret linguistic and cultural contexts. Sociolinguistics will also remain relevant as new dialects and forms of social interaction emerge. Language revitalisation efforts will continue to rely on cooperation between scholars and language communities.

Pedagogy is another enduring area of philology. The desire to learn new languages will persist, and philologists will continue to refine teaching methods. While technology may support language learning, human involvement and effort will remain crucial. In addition, specialised fields such as forensic linguistics, language creation, and the analysis of political discourse will continue to offer opportunities for research and professional practice.

Theoretical linguistics is also expected to evolve, becoming increasingly data-driven and experimentally grounded. Although neuroscience and computational models will inform future theories, human interpretation and conceptual analysis will remain essential (Jia, 2023).

As Yogi Berra observed, making predictions about the future is difficult. Nevertheless, this uncertainty contributes to the enduring appeal of philology. Technological change is occurring at an unprecedented pace; however, even the most advanced technologies depend on language for naming, describing, and understanding the world.

Philology is not limited to grammar or abstract theory. Language reflects human voices, emotions, memories, and stories. It carries collective human experience. Even if artificial intelligence learns to imitate human speech perfectly, the attribution of meaning remains a uniquely human ability.

In the future, philology will remain at the intersection of science and art. On one side are data, algorithms, and neural networks; on the other are literature, creativity, and human expression. The strength of the discipline lies in its capacity to unite these dimensions. Philologists will continue to study not only how language functions but also why people feel the need to communicate, express themselves, and be heard.

The future of philology remains uncertain, yet this uncertainty sustains its development. As long as language remains central to human life, philology will continue to evolve, transform, and retain its human character. Even in an increasingly digital age, language will remain one of humanity's greatest and most human achievements.

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THE FUTURE WE ARE CREATING TODAY

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The theme of travelling into the future has been the domain of science fiction literature for many centuries, from H. G. Wells' The Time Machine to Robert Zemeckis' Back to the Future. However, at the turn of the 20th and 21st centuries, this idea began to take on the characteristics of a scientific hypothesis and a cultural construct still actively forming today.

At different times, everyone has imagined and continues to imagine the concept of travelling into the future in their own way. For example, in his novel Nineteen Eighty-Four, George Orwell describes the future as a dystopian world, a totalitarian nightmare built on total control, fear and the suppression of humanity. Meanwhile, the future in Tommaso Campanella's The City of the Sun is an idealised, rational and just society based on the principles of reason, science and collective harmony.

Gradually, we are approaching this future step by step, but what will it be like, as in Orwell's pessimistic visions or those of his opposite, Campanella?

As for technology, robots and artificial intelligence are no longer science fiction but have become commonplace. Of course, the trend towards robotisation has positive consequences: freeing people from dangerous work, improving quality and efficiency, and increasing productivity. For example, according to the British tabloid Daily Mail, the ChatGPT artificial intelligence chatbot from the American company OpenAI could make a correct diagnosis for a child after 17 doctors had failed to do so. But, as with any large-scale phenomenon, there is a worrying side to this.

Of course, robots do everything better, faster and cheaper, so gradually millions of people find themselves out of work and their skills suddenly become obsolete. This leads to growing inequality and social tension because, for many people, work is a way to earn a living and achieve social status (Бауман, 2008).

When it comes to information, in the past, people had to make an effort to obtain the information they needed. For example, they had to travel thousands of kilometres to the Library of Alexandria. In the age of the Internet and artificial intelligence, people have the advantage of being able to obtain any information instantly. But there are pitfalls here, too. For example, people use AI instead of doing their own work at school or work. This is common in almost all areas of life, so people stop using their minds. In addition, while people used to get information only from books, platforms such as TikTok, Instagram, and others offer people intellectual fast food, which inevitably leads to degradation.

On the subject of culture, I would like to note that Arthur Conan Doyle once said: 'Nobody is interested in a dog biting a man, but it is interesting when a man bites a dog.' He used this phrase because events that go beyond the ordinary and violate established norms attract more attention than mundane ones. Unfortunately, nowadays, most bloggers use this principle, because 'bad publicity is still publicity' and it is easier and more accessible. In this way, they negatively influence each other and their audience and cause the decay of society. We already see and hear films, music, and paintings created by artificial intelligence. If everything continues in this direction, all writers, musicians, artists, and directors will disappear in forty years. After all, why should they do their job when a neural network can replace everything?

Thus, the future appears to us as a multifaceted and contradictory phenomenon. It can become an era of unprecedented progress and harmony between science and culture, or a time of social challenges, inequality and spiritual degradation. Technologies, in particular artificial intelligence and robotisation, open up endless possibilities for humanity, but simultaneously carry serious risks of losing values and creative individuality.

We must balance technical development and cultural heritage, using the latest achievements for progress rather than decline. The future is not a fixed scenario – it is created by our decisions today. Only a harmonious combination of science, culture, and moral principles can make it humane and dignified.

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Fushtey M. V.

STRATEGIE DI TRADUZIONE DELLE UNITÀ FRASEOLOGICHE CULTURALMENTE MARCATE DALL'ITALIANO ALL'UCRAINO: UN'ANALISI COMPARATIVA

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La fraseologia rappresenta una delle manifestazioni più significative dell'identità nazionale di una lingua, poiché riflette l'esperienza storica, la vita quotidiana e i valori di un popolo (Koptilov, 2002; Zorivchak, 2005). Nella traduzione dall'italiano all'ucraino le unità fraseologiche costituiscono una sfida particolare a causa della presenza di elementi culturalmente marcati che spesso non hanno equivalenti diretti nella lingua d'arrivo (Drahun, 2018). Non si tratta soltanto di trovare un corrispondente lessicale, ma anche di trasmettere le connotazioni, l'immagine e l'effetto pragmatico dell'espressione (Baker, 2011; Newmark, 1988). L'italiano, noto per la sua forte espressività, è ricco di idiomatismi legati alla gastronomia, alla religione e alla storia, il che richiede una scelta particolarmente attenta delle strategie traduttive (Eco, 2003; Mollica, 2010).

Nella traduttologia contemporanea le strategie di resa delle unità culturalmente marcate vengono considerate come un insieme di decisioni mirate a ridurre al minimo le perdite di contenuto e di forma (Baker, 2011). Nella traduzione delle espressioni fraseologiche italiane in ucraino si ricorre più frequentemente a quattro strategie principali: l'uso di un equivalente funzionale, il calco, la traduzione descrittiva e l'adattamento culturale (Mollica, 2010; Rossi, 2015). La scelta della strategia dipende dal grado di prossimità dei sistemi figurativi delle due lingue, dal genere testuale e dalle aspettative del destinatario (Drahun, 2018).

Una delle strategie più produttive è l'impiego dell'equivalente funzionale, cioè di un'unità fraseologica della lingua d'arrivo che, pur basandosi su un'immagine diversa, svolge la stessa funzione comunicativa e trasmette un significato simile (Baker, 2011; Mollica, 2010). Ad esempio, l'idioma *conoscere i propri polli*, usato per indicare una conoscenza approfondita del comportamento altrui, viene reso in ucraino con locuzioni che enfatizzano l'idea di familiarità totale, pur ricorrendo ad altre immagini. In modo analogo, l'espressione *far vedere i sorci verdi*, che implica la volontà di far passare brutti momenti a qualcuno, trova una resa adeguata in fraseologismi ucraini che trasmettono la stessa intenzione minacciosa e il medesimo grado di intensità emotiva (Newmark, 1988; Mollica, 2010).

Il calco, ossia la traduzione relativamente letterale della struttura e dell'immagine, risulta appropriato quando la base figurativa è trasparente e condivisa da entrambe le culture, come nel caso delle espressioni di origine biblica o mitologica (Newmark, 1988). Espressioni come *il figlio prodigo* o *il tallone d'Achille* vengono tradotte in ucraino con calchi ormai stabilizzati, che non richiedono ulteriori spiegazioni. Tuttavia, un calco meccanico può risultare fuorviante quando le associazioni culturali divergono. L'espressione *essere al verde*, che in italiano indica mancanza di denaro, in ucraino non si associa spontaneamente al colore verde; pertanto, un'imitazione formale dell'immagine risulterebbe artificiale. In tali casi, si preferiscono unità fraseologiche ucraine che veicolano lo stesso significato di

povertà o scarsità economica, ma tramite immagini radicate nella cultura locale (Zorivchak, 2005; Mollica, 2010).

Quando l'espressione contiene realia, toponimi o concetti culturali specifici e non dispone di un equivalente fraseologico consolidato, si ricorre spesso alla traduzione descrittiva (o esplicativa). Questa strategia consiste nello sciogliere l'unità fraseologica in una perifrasi che ne chiarisce il senso, accettando una certa perdita di condensazione e di forza figurativa in favore della precisione semantica (Baker, 2011; Drahun, 2018). Il concetto di *campanilismo*, ad esempio, rinvia a un forte attaccamento alla propria città o al proprio paese, con sfumature di orgoglio e chiusura localistica; nella resa ucraina è necessario esplicitare tali componenti di significato, poiché manca un termine univoco che copra l'intero campo semantico. Analogamente, l'espressione *dolce far niente*, diventata simbolo di una particolare filosofia del tempo libero e del piacere, viene spesso resa con soluzioni che combinano una parziale ripresa dell'immagine con una spiegazione del valore culturale sotteso (Eco, 2003; Folena, 1991).

L'adattamento, o sostituzione culturale, prevede invece la sostituzione dell'elemento della cultura di partenza con un elemento della cultura di arrivo che produca un effetto pragmatico ed emotivo analogo (Newmark, 1988; Zorivchak, 2005). Questa strategia è particolarmente frequente nel trattamento degli idiomatismi di ambito gastronomico, molto numerosi in italiano (Mollica, 2010; Rossi, 2015). L'espressione *tutto fa brodo*, che suggerisce l'idea che «qualsiasi cosa può tornare utile», può essere resa in ucraino attraverso proverbî che si fondano su immagini diverse ma veicolano lo stesso concetto di accumulo o utilità di ogni piccolo contributo. Anche *rendere pan per focaccia*, che esprime l'idea di restituire un torto, viene tradotta ricorrendo a unità fraseologiche ucraine basate su codici figurativi monetari o somatici, culturalmente più familiari rispetto all'immagine del pane e della focaccia (Rossi, 2015).

Un fattore decisivo nella scelta della strategia è il contesto d'uso. La stessa unità fraseologica può richiedere soluzioni diverse in funzione del genere testuale,

del registro e della situazione comunicativa (Baker, 2011). Il ben noto augurio *in bocca al lupo*, ad esempio, in situazioni informali tende a essere reso con una formula ucraina idiomatica, anch'essa accompagnata da una risposta convenzionale; in contesti più neutri o formali, invece, il traduttore può optare per una versione attenuata e non metaforica, che preservi la funzione di augurio senza mantenere l'immagine zoomorfa (Drahun, 2018; Zorivchak, 2005). In questo senso, il traduttore agisce come mediatore interculturale, chiamato a valutare non solo il significato denotativo, ma anche le implicazioni pragmatiche e socioculturali dell'espressione.

In conclusione, la traduzione delle unità fraseologiche culturalmente marcate dall'italiano all'ucraino non ammette una soluzione unica e universale. Il calco risulta efficace per gli internazionalismi e per le immagini condivise, mentre gli equivalenti funzionali garantiscono naturalezza e conservazione del potenziale espressivo; la traduzione descrittiva e l'adattamento culturale, infine, permettono di superare i casi di marcata specificità culturale e di potenziale intraducibilità (Baker, 2011; Mollica, 2010; Rossi, 2015). Una resa adeguata richiede non solo competenza bilingue, ma anche bicompetenza culturale e capacità di combinare in modo flessibile diverse strategie a seconda del testo e dello scopo comunicativo (Koptilov, 2002; Zorivchak, 2005). Le prospettive di ricerca futura includono lo studio delle nuove espressioni fraseologiche che emergono nel discorso digitale contemporaneo e delle peculiarità della loro trasposizione nell'asse italiano–ucraino (Drahun, 2018; Rossi, 2015).

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HUMANITY ON THE PATH TO TOMORROW

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The future has always fascinated humanity. Since ancient times, people have tried to look ahead: some created legends and tales, others wrote works of fiction, and still others sought to scientifically predict the development of civilisation based on the knowledge of their era. A common idea unites all these endeavours – to understand where humanity is heading, what awaits us in the coming decades, and what the world will be like for our descendants. This topic is critical today, as scientific and technological progress is developing at an extraordinary pace (Лук'янець, 2000). What was considered a fairy tale yesterday has become a reality today and may become commonplace tomorrow. That is why reflections on the future

of science, culture and technology inspire the imagination and make us think about our responsibility to humanity and the planet.

Science is the benchmark that determines the direction of civilisation's development. Modern advances in medicine give us reason to believe that in the near future, people will have a much better chance of living a long and healthy life. Genetic engineering technologies have already opened the door to treating serious hereditary diseases. In the future, they may help to defeat even such dangerous diseases as cancer and diabetes. This achievement meets humanity's key needs – preserving life and health. No less important is the issue of ageing: scientists worldwide are currently working to slow down this process. If the average life expectancy today is 70-80 years, it may double. This opens up new horizons, but at the same time forces society to seek answers: how to ensure a good quality of life for a larger number of older adults and rebuild the social system and economy under new conditions.

Space exploration will play a special role in the future. Humanity has long dreamed of distant star voyages, and now this dream is gradually becoming a reality. The exploration of the Moon and Mars and the launch of powerful telescopes capable of looking even further into the universe are no longer fantasies, but concrete steps scientists are taking. Space could become a second home for humans. This is entirely justified because population growth and deepening environmental problems on Earth are forcing us to think about finding new resources and territories for life. Colonies on Mars or even other planets still sound like science fiction today, but the pace of progress gives reason to believe that they may appear in the coming centuries.

It is impossible to imagine the future of science without energy. The depletion of natural resources and climate change are forcing us to look for new, safe energy sources. Solar, wind and geothermal energy already play an essential role, but the greatest hopes are pinned on creating thermonuclear reactors. They can provide humanity with virtually unlimited energy reserves without harming the environment.

If scientists can overcome technical difficulties and learn to control thermonuclear processes safely, humanity's energy problems will be a thing of the past.

The future is not only about discoveries in science and technology, but also about the development of culture. Culture shapes spiritual values and nurtures the ability to think, empathise and create. In the 21st century, culture is increasingly taking on a global dimension. Thanks to the Internet and modern means of communication, we can instantly get acquainted with the art of other countries, listen to music, watch films and theatre performances from different parts of the world. In the future, this process will only intensify. This will pave the way for greater understanding and cooperation between nations, but at the same time may threaten national identity. Therefore, a critical mission will be to preserve traditions, languages and cultural heritage so that each nation leaves its unique mark on human history.

The prospects for the development of art are also exciting. Already today, thanks to virtual and augmented reality technologies, projects are emerging where viewers become direct participants in events. One can imagine a theatre where the viewer influences the plot, or a painting that one can literally ‘enter’ and feel like a part of the artistic space. Such innovations will open up endless opportunities for creative self-expression. At the same time, digital technologies will ensure the reliable preservation of cultural heritage. Even if physical artefacts disappear, their digital copies will allow future generations to access the treasures of world art.

Technology is perhaps the most dynamic element of our future. Today, artificial intelligence helps doctors, engineers, teachers, and students. In the coming decades, its influence will only grow. But an important question arises: will humans retain their leading role, or will we cede machine control? This is one of the key ethical challenges of the future, because the balance between the benefits and risks of technological development depends on its resolution.

The development of transport systems will be no less significant. Uncrewed cars and trains of the new generation are already being tested. In the future, high-

speed travel will be possible thanks to vacuum trains. This will mean that people will be able to cross continents in hours. In addition, space tourism will gradually cease to be exotic and become accessible to a significant part of humanity. This will not only broaden horizons but also accelerate cultural exchange and integration.

Of course, education will also change. Thanks to digital technologies, learning will become even more accessible and individualised. Pupils and students can gain knowledge in virtual laboratories and museums, travelling through time and space without leaving home. Each person can determine the pace and direction of their own learning. This will allow everyone to reach their full potential and make education more flexible and effective.

So, travelling into the future opens up incredible opportunities for humanity. Science will bring discoveries and help overcome global problems related to health, resources and space exploration. Culture will preserve our spiritual heritage and, at the same time, contribute to the creation of new forms of art. Technology will make our lives easier, change how we think and open up new avenues for development. But at the same time, the future requires us to be wise and responsible: how to use these achievements for the good, how not to lose our humanity in a world of high technology, how to preserve nature and values.

The future will undoubtedly be exciting. However, it does not exist separately from the present. It begins here and now – in our decisions, discoveries, and steps towards mutual understanding. And it is up to us whether this new world will be harmonious, humane and just.

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ADVANCEMENTS IN ENGLISH LANGUAGE TEACHING

English language teaching (ELT) has entered a period of rapid transformation, driven by technological innovation, evolving learner needs, and global socio-economic shifts. The convergence of artificial intelligence (AI), digital platforms, and new pedagogical frameworks has redefined how English is taught and learned. This article explores key advancements in ELT, drawing on trends reports, empirical researches, and scholarly reviews of language education.

1. Redefining Innovation in ELT

The British Council's 2024 review emphasizes that innovation in ELT extends beyond technology to include pedagogy, content, and methodology (Chong, 2024). While AI and digital platforms dominate discussions, the report stresses that innovation must ultimately serve learners' needs – enhancing outcomes, fostering autonomy, and preparing students for real-world communication. Zhao (2025) reinforces this by showing that AI-driven personalization is most effective when combined with human-centered pedagogy, ensuring that technology complements rather than replaces teachers.

2. Technology-Enhanced Learning and AI Integration

The most visible advancement is the integration of AI-driven tools into language learning. Applications now provide speech recognition, adaptive feedback, and personalized learning pathways, enabling learners to practice speaking and writing in interactive environments (Chong, 2024). Zhao's mixed-methods study demonstrates that AI tools significantly improve learner engagement, motivation, and outcomes, particularly when they provide real-time corrective feedback and adaptive challenges (Zhao, 2025).

A broader review of ELT developments confirms that AI and gamification are among the fastest-growing areas of research, with evidence suggesting improved learner retention and confidence (Motteram & Dawson, 2025). However, scholars

caution that overreliance on AI risks reducing the teacher's role to that of a facilitator, potentially undermining the relational and cultural dimensions of language learning.

3. Learner Autonomy and Self-Directed Learning

Another major shift is the emphasis on learner autonomy. With abundant online resources, students are increasingly encouraged to take ownership of their learning. The British Council identifies this as a dual trend: empowering learners with strategies for independent study and providing them with digital tools to practice at their own pace (Chong, 2024). Zhao's findings suggest that autonomous learning is most effective when supported by AI-driven scaffolding, which helps learners set goals, track progress, and reflect on achievements (Zhao, 2025).

4. Critical Thinking, Global Citizenship, and Intercultural Competence

Modern ELT is no longer confined to grammar and vocabulary. Instead, it integrates critical thinking, problem-solving, and intercultural communication skills. The British Council highlights the use of the UN Sustainable Development Goals (SDGs) as frameworks for classroom projects, encouraging learners to engage with global issues while practicing English (Chong, 2024). This approach positions students not just as language learners but as agents of change in a globalized world.

Research supports this trend: a review of ELT developments from 2014–2024 found that intercultural competence and global citizenship education are increasingly embedded in curricula, reflecting the role of English as a lingua franca in diverse contexts (Motteram & Dawson, 2025).

5. Emotional Intelligence and Soft Skills

Language learning is also being reframed as a holistic process that includes emotional intelligence, empathy, and interpersonal skills. Programs such as LISTEN in Stories and TransFor.ME integrate storytelling and reflective practices to cultivate self-awareness and empathy (Chong, 2024). Zhao (2025) notes that AI-driven platforms can also support emotional engagement by tailoring content to learners' interests and providing encouraging feedback, thereby boosting motivation.

6. Real-World Application and Task-Based Learning

The shift from rote memorization to authentic, real-world communication is another defining advancement. Learners are increasingly exposed to task-based and project-based learning, where English is used as a tool to solve problems, collaborate, and create. This reflects the broader move from "knowing a language" to "using a language" (Chong, 2024). Such approaches align with research showing that contextualized learning improves both fluency and confidence, preparing learners for professional and social interactions beyond the classroom (Motteram & Dawson, 2025).

7. Diversity, Inclusion, and Accessibility

Finally, ELT is embracing diversity and inclusivity. Materials now reflect a wider range of cultural perspectives, age groups, and learner abilities. Initiatives such as the Bloomers Learning Initiative address the needs of older learners, while others focus on underrepresented communities (Chong, 2024). This inclusivity ensures that English learning is not only a linguistic endeavor but also a socially equitable one.

Conclusion

The advancements in English language teaching reflect a multi-dimensional evolution: technological innovation, learner autonomy, intercultural competence, and emotional intelligence are now central to pedagogy. While challenges remain, such as balancing AI with human interaction and ensuring equitable access, the trajectory of ELT is clear. It is moving toward a holistic, learner-centered, and globally relevant model that prepares students to participate meaningfully in an interconnected world.

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DIGITAL ARCHIVES AND CULTURAL MEMORY: RECLAIMING HISTORICAL NARRATIVES IN THE POSTCOLONIAL ERA

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Digital archives have become powerful tools for reclaiming suppressed or fragmented historical narratives, especially in postcolonial contexts. This article explores how digital humanities initiatives reconfigure cultural memory by enabling access, reinterpretation, and collaborative curation of historical materials. Through case studies of community-driven archival projects in Ukraine, South Africa, and India, the study examines how digital platforms challenge colonial epistemologies, foster transnational dialogue, and democratize historical knowledge. It argues that digital archives are not neutral repositories but dynamic spaces of memory-making, resistance, and identity reconstruction.

In the wake of colonialism, many societies have grappled with the erasure, distortion, or marginalization of their historical narratives. Traditional archives – often shaped by imperial institutions – have preserved selective records that reflect dominant ideologies while silencing subaltern voices. The emergence of digital

archives offers a transformative alternative: a space where communities can reclaim, reinterpret, and disseminate their own histories.

Digital archives are not merely digitized versions of physical collections. They are interactive, multimodal, and participatory platforms that allow users to engage with historical materials in new ways. In postcolonial settings, they serve as tools of resistance and reparation, enabling the reconstruction of cultural memory from below. This article investigates how digital archives contribute to the reconfiguration of historical narratives, focusing on their role in postcolonial identity formation and transnational memory work.

This study employs a qualitative, comparative methodology, analyzing three digital archival projects:

- "Declassified Ukraine": A multilingual platform that curates Soviet-era documents, oral histories, and visual materials to reconstruct suppressed narratives of Ukrainian resistance and cultural autonomy.

- "South African History Online (SAHO)": A community-driven archive that documents anti-apartheid movements, indigenous knowledge systems, and local histories excluded from official records.

- "Pad.ma (Public Access Digital Media Archive)": An Indian initiative that provides annotated video footage of everyday life, protests, and cultural events, challenging dominant media representations.

Each case is examined through the lens of cultural memory theory, postcolonial historiography, and digital humanities practice. The analysis focuses on:

- Archival structure and accessibility

- Community participation and editorial ethics

- Narrative strategies and metadata politics

- Transnational collaboration and linguistic diversity

Digital archives function as memory practices rather than passive storage systems. They allow users to curate, annotate, and remix historical materials, fostering dialogic engagement with the past. In "Declassified Ukraine", for example,

users can explore multilingual testimonies and visual documents that challenge Soviet-era historiography and foreground regional identities.

SAHO's model emphasizes grassroots participation, inviting educators, students, and activists to contribute content and shape editorial decisions. This democratization of archival authority disrupts the colonial logic of centralized control and promotes pluralistic memory-making.

Pad.ma's use of annotated video enables layered storytelling, where metadata becomes a site of interpretation. By foregrounding everyday life and protest footage, the archive resists sanitized national narratives and amplifies minoritarian perspectives.

These platforms also engage in transnational dialogue, connecting diasporic communities and fostering cross-border solidarity. Their multilingual interfaces and open-access policies reflect a commitment to inclusive historiography and epistemic justice.

Digital archives are reshaping the epistemological foundations of historical inquiry and cultural memory. In postcolonial contexts, where official records often reflect the biases of imperial power, digital platforms offer a means of epistemic redress – a way to restore agency to communities whose histories have been fragmented, erased, or distorted. These archives do not merely preserve; they reconstruct**,** reinterpret**,** and reposition memory within a framework of ethical engagement and participatory knowledge-making.

The projects examined – Declassified Ukraine, SAHO, and Pad.ma – demonstrate that digital archives can serve as living memory systems**,** responsive to contemporary social movements, linguistic diversity, and transnational solidarities. They challenge the archival myth of neutrality by foregrounding editorial choices, metadata politics, and the role of users as co-curators. In doing so, they transform the archive from a static institution into a dialogic space where historical narratives are continuously negotiated.

This transformation has methodological implications for humanities research. Scholars must now grapple with platform logics, interface design, and algorithmic visibility as integral to the archival experience. The digital archive becomes not only a source but a medium – a site where form and content are inseparable, and where the politics of access, annotation, and circulation shape the meaning of historical materials.

Moreover, digital archives invite a rethinking of temporal frameworks. They collapse linear chronologies, enabling users to traverse memory through hyperlinks, tags, and thematic clusters. This non-linear navigation mirrors the fragmented temporality of postcolonial experience and diasporic identity, offering new models for historical representation.

Looking ahead, the sustainability and ethical governance of digital archives will be critical. Issues of data sovereignty, open access, digital preservation, and community consent must be addressed to ensure that these platforms remain inclusive, accountable, and resilient. Collaborative models involving scholars, technologists, educators, and community stakeholders will be essential to maintain the transformative potential of digital memory work.

In sum, digital archives are not merely technological innovations – they are cultural interventions. They reconfigure how we remember, who gets to narrate, and what counts as history. In the postcolonial humanities, they offer a path toward historical justice, intercultural dialogue, and critical imagination – a future where memory is not inherited passively but crafted actively, ethically, and collectively.

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THE STRATEGIC ROLE OF ENGLISH PROFICIENCY IN SHAPING THE FUTURE OF ENGINEERING AND TECHNOLOGICAL INNOVATION

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As we step into the future we want to create, shaped by science, culture, and technology, the ability to communicate across boundaries becomes more vital than ever. In this dynamic environment, the English language emerges as a powerful key, unlocking access to cutting-edge engineering knowledge, international collaboration, and the innovations of tomorrow. It empowers scientists and engineers to connect across borders, fostering a global community of knowledge and innovation. From AI-driven design to smart infrastructure, English enables participation in the global dialogue that defines tomorrow's technological revolution. By mastering this linguistic key, engineers not only unlock knowledge but also shape the cultural and scientific narratives that drive the world's advancement.

English has emerged as a global language of communication, fostering a sense of connection and community in numerous fields of knowledge. It serves as a common medium for collaboration, research transmission, and technological advancement across borders. Its widespread use enables professionals, academics, and innovators from diverse linguistic backgrounds to exchange ideas, access global resources, and contribute to international progress with greater efficiency and impact.

Engineering aligns with this global trend. In a world where technology is rapidly evolving, mastery of the English language and literacy are becoming increasingly essential for engineers seeking to compete in the international job market (Dearden, 2015).

In the world of engineering, where experience and innovations often require communication with international colleagues, command of the English language is not just a valuable addition but a reflection of today's societal demands. Many infrastructure specialists struggle to articulate sophisticated technical ideas in a language other than their own because their vocabulary is not sufficiently developed. Moreover, professional terminology is constantly increasing in volume and being modified, introducing new phrases and expressions that engineers must master to engage effectively in a professional environment. In this paper, we will explore why we consider English to be the key to success in the engineering of the future, as well as its crucial role in professional development, global educational trends, and international collaboration.

Since every successful career starts with the right learning trajectory, the initial stage is English in education. International study programs implement the concept of cross-cultural knowledge exchange by contributing to the globalization process. The curricula presuppose a bilingual approach to teaching, where English has been a prominent language for decades. Therefore, many top-ranked global universities offer engineering programs in English. This enables students to acquire knowledge and develop skills in accordance with international standards, become familiar with the latest advancements in the field, and interact with teachers and fellow students from diverse countries. This international language opens the door to participation in numerous programs for those ready to make a positive impact on the world.

Equally important is access to scientific publications. Most scientific articles, research, and technical documents are published in English. Engineers who speak this language can receive up-to-date information about the latest technologies and innovations directly affecting their professional activities. English proficiency

ensures clarity and precision in tasks such as report writing, presenting findings, and explaining systems, and enables participation in international conferences and seminars. More often, English is the primary language of international symposiums in engineering. Participation in such events allows engineers to exchange experiences, present their advancements, and establish business contacts with colleagues from other countries. This not only broadens their professional network but also fosters a sense of belonging and connection to a global community of like-minded professionals, making them feel included and valued.

English, as a vital component in the study of innovation and technology, fosters collaboration among engineers facing the challenges of globalization. However, theory remains inert without practice. Fluency and a strong command of English enable engineering graduates to participate in international research projects, exchange ideas, and implement new technological solutions, creating a sense of connection and global community.

For professionals in any field, success often begins with effective verbal communication. A competent and well-delivered speech not only ensures understanding and the desired response from partners and clients but also paves the way for professional success. In globally connected enterprises, proficient English communication is a key driver of success, motivating and guiding employees towards their goals.

When studying English for engineers, they develop stable skills in using a foreign language in various situations:

• communication with a future client or partner without an interpreter (which improves interaction and sets up for personal contact with the partner);

• preparation and presentation of the product at the international level (which expands the consumer base and takes it to a new level);

• processing orders for foreign clients (allows for foreign capital investments);

• telephone conversations and business correspondence with foreigners (save time, money without keeping a full-time translator);

• work with English-language sources of knowledge that help in promoting technical business.

We emphasize that Technical English for Engineers will not only aid in everyday communication but also in performing complex work tasks, as spoken English is insufficient for cooperation and studying professional documentation. Even in Industry 4.0, and even more so in the upcoming Industry 5.0, a high level of individual English proficiency is insufficient for functioning within multicultural engineering teams, where precision and clarity are vital, as well as for bridging cultural and professional gaps in multinational corporations. Instead, top-ranked educational institutions and language schools offer a team-mode course of English for their motivated students. Thus, one can standardize technical English across their engineering teams, ensuring consistent global communication. One will learn to customize modules to match their organization's specific engineering fields, project types, or operational needs. One will access a real-time analytics dashboard to track team progress, identify skill gaps, and optimize training effectiveness.

English remains one of the main international languages. In the future, in peacetime, Ukraine will face a major reconstruction (infrastructure, architecture, roads, bridges, airfields, etc.). This is impossible without foreign investments, the help of foreign specialists, and practices. Much will depend on negotiating, communicating, and studying without the aid of translation assistance. Therefore, English and engineering must always work in tandem to achieve the set goals. Mastery of technical skills alone is not enough without the ability to communicate ideas clearly, collaborate across cultures, and engage in global innovation. By integrating linguistic competence with engineering expertise, professionals become better equipped to lead, adapt, and thrive in the interconnected world of tomorrow.

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Isgandarzada Ramin

FEATURES OF THE AZERBAIJAN LANGUAGE

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With the beginning of the full-scale invasion, the number of foreign students in Ukraine has significantly decreased. However, Ukrainian higher education institutions continue to be in demand among foreigners. A significant number of foreign students studying in Ukraine are from Azerbaijan. The state language of this country is Azerbaijani. Therefore, it would be appropriate to talk about the peculiarities of the native language of students from Azerbaijan studying in Ukraine. The purpose of the work is to study the historical path of development of the Azerbaijani language and its modern features.

Azerbaijani is a language belonging to the Oghuz group of the Turkic language family with noticeable features of the Kipchak group of languages. The Azerbaijani language is widespread in Azerbaijan, Iran (Ardebil province, East Azerbaijan, West Azerbaijan), Dagestan, Georgia (Kvemo-Kartli province) and other countries. The Azerbaijani language is spoken by about 23 million people.

The Azerbaijani language is divided into 4 dialect groups that differ at the phonetic and lexical levels:

- eastern (Kuban, Baku, Shemakhan dialects, Mughan and Lankaran dialects);
- western (Kazakh, Karabakh, Ganja dialects, Ayrum dialect);
- northern (Nukhin dialect and Zakatalo-Kakhi dialects);
- southern (Nakhchivan, Ordubad, Tabriz dialects).

The oldest written records date back to the 11th century.

The modern literary language, which has been developing since the 13th century, has acquired expressive forms in the poetry of K. Burganeddin, I. Nesimi. The formation of the literary Azerbaijani language is associated with the poetry of Shah Ismail Khatai and the creative work of M. Fizuli and the poets of his galaxy.

The literary Azerbaijani language was finally formed in the 19th century as a result of the influence of the folk language, as evidenced in the works of M. Akhundov, S. Vurgun and others.

Until 1929, the writing of the Azerbaijani language in Azerbaijan was based on Arabic graphics, from 1939 to 1992, writing based on the Cyrillic alphabet was used, from 1929 to 1939 and from 1992 – on the basis of the Latin alphabet.

In Dagestan, the alphabet based on the Cyrillic alphabet continues to be used for the Azerbaijani language.

In Iran, the Azerbaijani language uses Arabic script (Halimonenko).

In the vocabulary of the Azerbaijani language, about 60% of the words are of Turkic origin, 30% are Arabic and Persian, and the remaining 10% are borrowings from Russian and other European languages. This linguistic mosaic reflects the rich history of cultural interactions of Azerbaijan.

The Azerbaijani language is characterized by palatal synharmonism, agglutinative grammatical structure, and the widespread use of suffixes and conjunctions. The Azerbaijani language has 9 vowels and 23 consonant phonemes.

In the modern Azerbaijani script based on the Latin alphabet (used in Azerbaijan) and the Cyrillic alphabet (used in Dagestan), each phoneme of the Azerbaijani language corresponds to one letter (Interesting facts).

A characteristic feature of the phonetics of the Azerbaijani language is the high frequency of use of the phoneme – in all positions, the aspiration of voiceless consonants *p*, *t* and partly k (i.e. the appearance of the sound *h*) is noticeable, which is also characteristic of the Armenian and Georgian languages, the presence of the so-called *mediae lenes* (incomplete voiced consonants), also characteristic of the

Armenian and Georgian languages. Long vowels are found in words borrowed from Arabic and Persian.

The apostrophe is used in the orthography of the Azerbaijani language.

One of the most striking features of Azerbaijani grammar is the case of nouns. Azerbaijani has six distinct cases, each with a specific function. These are: nominative, genitive, dative, accusative, locative, and ablative. For example, *kitab* (book) can become *kitabın* (of a book) to convey possession.

There is no gender category in Azerbaijani. This means that there is no distinction between *he*, *she*, and *it* in pronouns and adjectives.

Azerbaijani verbs are rich and expressive, allowing you to convey a wide range of actions, emotions, intentions, and more. The key to mastering the conjugation of Azerbaijani verbs is understanding the infinitive form (the basic, unconjugated form of the verb) and the various suffixes that indicate tense, person, and number. For example, the infinitive *görmək* (to see) can become *görürəm* (I see) or *gördüm* (I saw) through conjugation.

The syntax has a developed system of compound sentences. Usually, in a simple sentence, the subject is at the beginning of the sentence, followed by the object, and then the predicate. For example: *Mən Azərbaycanı sevirəm* (I Azerbaijan love) (Azerbaijani grammar).

Thus, Azerbaijani is a unique and fascinating language spoken by millions of people in the Caucasus region. With a rich history, diverse culture, and a mixture of Turkish and Persian influences, Azerbaijani provides a unique linguistic experience. Azerbaijani grammar may seem complicated at first glance, but to get a true understanding of the language, one must delve into Azerbaijani thinking, traditions, culture, worldview, and history of Azerbaijan.

Today, interest in the Azerbaijani language is primarily associated with the development of educational services in Ukraine, economic and business ties, the political situation, the volunteer movement, and migration. Azerbaijani students, as native speakers, can become a subject of international communication for Ukrainians

who want to learn the Azerbaijani language. Therefore, it is advisable to familiarize yourself with the history of development and features of the modern Azerbaijani language.

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THE FUTURE OF TRANSLATORS IN THE AGE OF ARTIFICIAL INTELLIGENCE

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It can be stated with confidence that the emergence of artificial intelligence has divided our world into a «before» and «after». Modern technologies are rapidly transforming global reality. Furthermore, many professions are already being gradually replaced by AI, and people are getting anxious about the potential loss of their jobs.

Labour markets are experiencing the growing integration of artificial intelligence. Nevertheless, there remain fields that computers will never fully replace. In particular, this article focuses on the profession of translators and their prospects in an era of digital development.

1) Current development of AI

At this stage, artificial intelligence technologies are not advanced enough to replace professional translators. A computer may confuse terms, substitute concepts, and generate multiple variants of the same term. Moreover, the longer the text, the greater the likelihood of discrepancies and inaccuracies in the translation. In the context of legal, medical, or military documentation, even the smallest mistake can be dangerous.

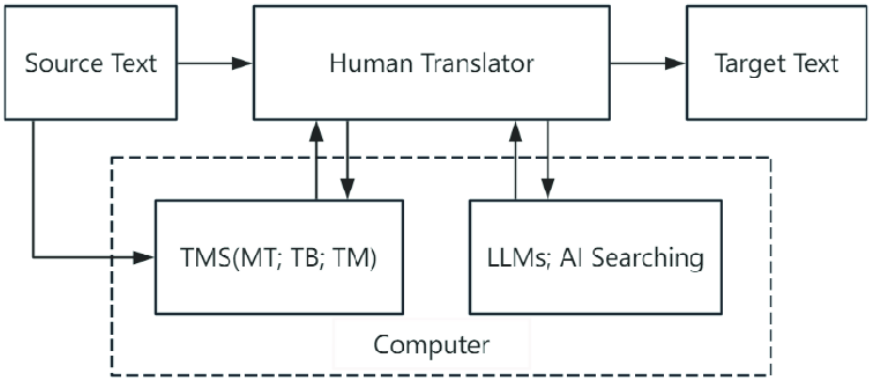
The way in which LLM (large language models) – powered chatbots «communicate», simulates, yet fundamentally differs from, human communication. As a result of that intricate process known as an algorithm, the chatbot generates the most probable next word, in a given sequence of words. Algorithms follow a deterministic, mathematical logic, predicting the most likely next words, but are unable to select the most relevant or correct words, unlike human beings (Peeters, et al., 2025).

The robotic automation technology has already spread its wings in several domains, such as construction, manufacturing, retail, travel industry, and more. On the top of that, lately, there has been a report issued by Leisurejobs.com stating that this technology is likely to set its foot in almost every major industry. By 2035, it will replace approximately 47% of the human force (United Translations, 2018).

2) Coordinated collaboration

The human-machine collaborative translation model highlights the symbiotic relationship between human expertise and machine automation. Both components human cognition and machine efficiency are indispensable. The machine aids in speeding up the translation process, handling repetitive tasks, and providing useful suggestions, while the human translator ensures that the final product is accurate,

meaningful, and contextually appropriate. By combining the strengths of both, this model enhances translation efficiency, accuracy, and consistency, making it a powerful approach for modern translation workflows (Chen, R., Guo, B., 2024).



Human-machine collaborative translation model

Don't just embrace new technology – work for and collaborate with the tech companies and engineers to shape the future. Damien Fan, Vice President of the Executive Committee of the International Association of Conference Interpreters (AIIC), admitted he initially held many prejudices against AI. He is not alone among interpreters. An in-depth survey conducted by SafeAI found that respondents had strong feelings about whether AI interpretation apps and tools were good, but only 11% had actually tried them. Experiment with the tools to become truly informed evaluators (Middlebury Institute of International Studies at Monterey, 2024).

3) The translators' future

While routine, everyday translations can be easily and freely automated with minimal time investment, texts requiring special attention, cultural adaptation, empathy, and a sense of responsibility cannot be handled reliably by AI. At this stage, the likelihood of fully replacing or displacing professional translators from the labour market remains minimal. There remains a vast range of texts that cannot be produced without specific knowledge.

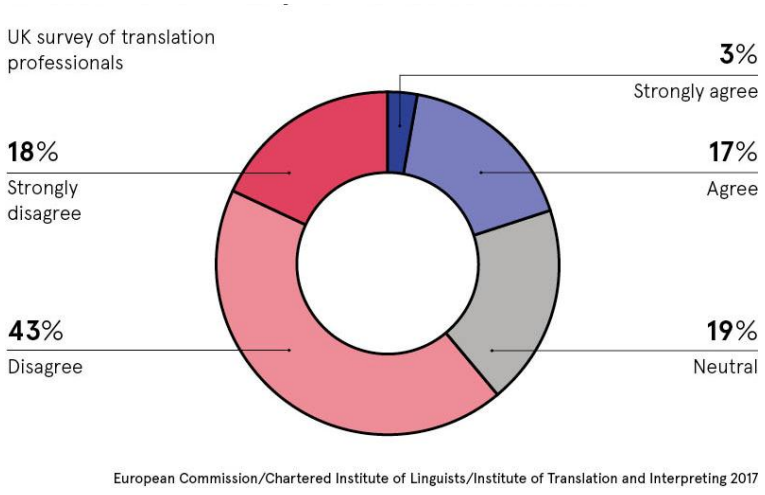
Nicholas Thompson, CEO of *The Atlantic*, has observed a counterintuitive trend: AI is increasing the number of people employed in translation. «Better LLMs increase the speed at which translators work», – says Thompson. Recent studies

support this claim. According to research, translators using AI models complete tasks 31% faster on average, with time reductions from 10 minutes per task to just over 6 minutes. AI does not reduce the number of translators; rather, it increases the demand for their work as a result.

As the technology becomes more intelligent and errors decrease during the next decade, some important limitations will remain in place. That's why some experts believe people will always have a part to play when it comes to translation and language at work.

Dr Catherine Hua Xiang, programmer director of Chinese language and culture for business at the London School of Economics, says there are three reasons for this: the meaning of language is always context based; language is closely related to human emotions, so the subtlety of tones and voices change the impact and meaning; and language can't be separated from culture.

In a guest-host relationship in a Chinese business setting, for example, it is considered polite and necessary to insist and impose on guests to accept the invitation or have more food. This is considered essential to show sincerity and hospitality. Chinese people will use the imperative form, such as «You must come» as an invite, or «Eat, eat, eat» or «Eat more, you are not eating enough», during the actual business meal. Despite the fact it may sound like orders, it is absolutely not in this particular context (Raconteur. (2018).



The chart presents the results of a UK survey conducted among professional translators (European Commission / Chartered Institute of Linguists / Institute of Translation and Interpreting, 2017) The findings clearly show that the vast majority of translators do *not* believe technology will diminish the role of humans in the profession:

- 18% strongly disagree
- 43% disagree. Together, this represents 61% of professionals who are convinced that human translators will remain essential.

In contrast, only:

- 3% strongly agree
- 17% agree. Thus, only 20% anticipate a significant decline in the importance of human translators. An additional 19% remain neutral.

All fears expressed by translators about losing their jobs resemble the historical situation of the Industrial Revolution, when people feared losing their livelihoods to machines, yet in reality those very machines created more employment opportunities. The translation industry may follow a similar path: automation is likely to stimulate the emergence of new professional roles rather than eliminate the profession itself.

Conclusion

Despite the rapid development of artificial intelligence technologies and their increasing integration into the labour market, the translation profession continues to demonstrate its clear advantages over computer systems. It is impossible to produce a high-quality translation without knowledge of culture, history, idioms, set expressions, and specialised terminology.

AI should be viewed as an assistant rather than a competitor capable of «taking over» the profession. To remain highly qualified, translators must skilfully integrate modern technologies with their own expertise. It is this synergy that ensures high-quality translation and opens new opportunities for professional growth within the

field. No computer has yet been able to substitute for the human mind, intuition, and genuine emotions.

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Kurapov D. M.

FOREIGN LANGUAGE AS A MEANS OF INTERCULTURAL COMMUNICATION

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Abstract. This article discusses the crucial role of a foreign language for effective communication among people globally. We explain that knowing grammar alone is no longer enough; understanding the cultural context is vital. The paper

highlights the elements of good communication, including social rules and non-verbal cues, not just the words used. We analyze common communication failures and propose effective language learning methods that help students become true intercultural mediators.

Introduction. The world is closely linked today, and we interact constantly with people from every corner of the globe. A foreign language has become an essential tool for this interaction. Intercultural Communication (IC) is much more than a simple information exchange. It’s a process where the language carries national values, customs, and worldviews. To have a successful dialogue, strong language skills must be paired with intercultural competence. Our goal is to illustrate how culture and language are inseparable, and how to best utilize a foreign language to connect smoothly with others.

Language and Culture. Why they are linked? It's a mistake to view language as just a set of words that can be translated. Language always reflects the nation's culture, history, and way of life.

For instance, cultural norms dictate how we address elders, which topics are safe for jokes, and which are off-limits. If we are unaware of these nuances, we might unintentionally cause offense, even if our grammar is perfect.

Modern language education specialists stress that effective communication requires a blend of *skills:*

– *Basic Language Skills:* knowledge of grammar, vocabulary, and correct pronunciation.

– *Social Awareness:* understanding when and how to speak to match the situation. For example, knowing how to address a manager versus a friend.

– *Interaction Skills:* the ability to achieve goals through language (asking, refusing, apologizing) in a way that is culturally appropriate.

– *Cultural Knowledge:* the capacity to understand foreign customs, avoid stereotypes, and flexibly adjust one's behavior during communication.

If we ignore the cultural side, even excellent grammar won't save us from communication troubles.

Why misunderstandings occur in communication? Even with good command of a foreign language, communication can be tricky due to differences in social rules and non-verbal cues. Ukrainian scholars also analyze these distinctions in communication patterns.

For example, some cultures transmit much information through context and hints (Japan, China), while others speak directly and openly (Germany, USA).

When speakers from such different cultures communicate, confusion arises. For instance, if an Asian colleague says, "I will think about it", it often means "No." But a direct speaker might assume there's still a chance for agreement. In such cases, the foreign language acts as a filter, which can slightly distort the original meaning.

Additionally, non-verbal language is crucial-gestures, facial expressions, personal space, and the perception of time. The same gesture can have completely opposite meanings in different countries. Therefore, a foreign language must be learned alongside these non-verbal rules.

How to make language learning more effective? The current goal of foreign language teaching is not to create an "ideal native speaker", but to train the student to be a "cultural bridge". The main task is to teach the person not just to talk, but to function in a foreign environment, understanding the cultural ideas behind every word.

– *Case Studies and Role-Plays:* discussing real or imagined situations where cultural differences caused a conflict.

– *Critical Cultural Perspective:* the ability to compare one's own culture with others, realizing that universal rules don't exist.

– *Using Authentic Materials:* incorporating not just textbooks, but videos, social media, and other current resources that show how the language is used every day.

Conclusion. A foreign language is key to intercultural communication, yet it can both help and create obstacles in the dialogue. To succeed, one must move beyond grammar and develop deep cultural knowledge. This means understanding the social rules that underpin the language. The aim of language study today is to prepare individuals who can be effective "cultural mediators" and promote understanding among nations.

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Levenets Ye. V.

ETIQUETTE: HISTORY OF ORIGIN, PLACE AND ROLE IN MODERN CULTURE

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Human behavior in society is a kind of calling card, by which one can learn not only where a person grew up, but also how they were raised and how they treat people. An English proverb states: better good habits than good principles, and better good manners than good habits.

The ability to conduct oneself properly in society is one of the components of success. Modern etiquette inherits the customs of practically all peoples from ancient times to the present day. At their core, these rules of behavior are universal, as they are adhered to not only by representatives of a given society but also by representatives of various socio-political systems existing in the modern world. The peoples of each country introduce their own amendments and additions to etiquette,

conditioned by the social order of the country, the specifics of its historical structure, national traditions, and customs. The understanding of the functional significance of etiquette for the development of society and each individual is affirmed daily.

What is etiquette? Etiquette is a set of rules of behavior concerning the external manifestation of attitude towards people (treatment of others, forms of address and greetings, behavior in public places, manners, and clothing).

Currently, there are several types of etiquette:

- everyday etiquette – a set of rules, traditions, and customs observed by people when communicating with each other;
- court (palace) etiquette – a strictly regulated order and forms of conduct established at the courts of monarchs (taking into account national characteristics);
- diplomatic etiquette – rules of behavior for diplomats and other officials during contacts at various diplomatic receptions, visits, negotiations;
- military etiquette – a code of rules, norms, and manners of behavior generally accepted in the army for military personnel both on and off duty.

Strict regulation of behavior and human communication permeates all of human history. However, as human living conditions change and education and culture grow, some rules of behavior are replaced by others. What was previously considered indecent becomes generally accepted, and vice versa.

History of Etiquette

It is traditionally considered that the countries of origin of etiquette are England and France, but the way of life in these countries at that time was such that in those cruel and rough conditions, a person could not improve in their spiritual and moral beginnings. The first rules of behavior, which became the basis of behavioral culture, arose together with human society. Their main task was to create the most favorable conditions for survival. With the development of social organization, behavioral regulation also became more complex.

As early as the 3rd millennium BC, the Egyptians valued the ability to use cutlery and eat silently and beautifully. Such behavior was regarded as a great virtue

and a necessary component of culture. It was in Egypt that the custom of locking doors with a key first appeared. In ancient Greece, they learned to unlock locks, and keys then were more than a meter long and were worn over the shoulder. The Greeks also developed diplomatic etiquette, creating a solemn embassy ceremonial. Their ambassadors carried so-called staffs of Hermes and were given instructions on how to conduct negotiations. The instruction was written on two cards or tablets folded in half. They were called "diplomas". Hence the word "diplomacy" appeared.

The inhabitants of Scandinavian countries were the first to introduce into the rules of polite behavior the custom of giving places of honor to women and the most respected guests. In the East, rules were perceived not as human institutions, but as a reflection of the celestial order.

Western European etiquette began to form during the Middle Ages. In other words, the Dark Ages. In the 11th century, the social system of chivalry arose, spreading throughout Europe, exerting a huge influence on European etiquette and creating a multitude of new ceremonies and rituals around the feudal aristocracy. Every action of a knight, his clothing and its color, his words and gestures – everything had a certain symbolic meaning. Even in those cases where, it would seem, personal initiative was required, the knight had to coordinate his behavior not with common sense, but with the requirements of etiquette.

Italy deserves, in fairness, to be named the birthplace of etiquette. The ennoblement of the morals of Italian society begins as early as the 14th century. Thus, the first half of the 14th century dates the course of good manners, which was published by Giovanni della Casa, a Florentine by origin, under the title Il Galateo. This is a beautifully and soulfully written instruction both in an exemplary lifestyle and regarding delicacy and tact in general. Thanks to this work, some researchers believe that it was the Italians of the Renaissance era who recognized tactfulness as a generally significant social duty and a distinguishing mark of education and good breeding.

The concept of an individual setting appears at the end of the 15th century. At this time, during table setting, they began to bring each person a plate, spoon, and knife, but everything except soup was still eaten with hands, wiping them on clothes or the tablecloth. In rich houses, bowls for rinsing fingers were served, sometimes after every change of dishes. The use of a knife and fork for eating (for preparing food or taking it from a dish, it was known earlier) develops by the 16th century and is the greatest progress in European table etiquette. In the 16th century, forks were used for eating only in Italy; the rest of the European countries were in no hurry to accept this innovation. Thus, in England, the use of forks was not mentioned before 1600, and rare exceptions caused surprise. For example, at the beginning of the 17th century, the Englishman Thomas Coryat, who visited Italy, was impressed by the Italian cutlery, but quickly got used to the fork and continued to use it after arriving in England, for which he received the nickname "fork-bearer" from his compatriots. The system of court etiquette reached its apogee in the 17th century at the court of Louis XIV, where every trifle was ritualized through the efforts of the "Sun King". The ceremonies of that time elevated the king to the level of an inaccessible deity. In such conditions, fundamental importance was attached to questions of precedence. Court etiquette gave rise to diplomatic etiquette, as it was at royal courts that receptions of foreign embassies took place.

Finally, enlighteners in the 18th century saw that court etiquette was remote from the main mass of the population and called for more natural manners. Ideas about good manners become international, as people begin to travel a lot.

Good upbringing implied a natural manner of holding oneself in combination with politeness and attention to other people. Starting from the 18th century, the study of etiquette enters the mandatory education program.

Unlike previous centuries, 19th-century etiquette bore a bourgeois character. Religious piety began to be valued more, expressed in daily family prayers before meals and at night. External observance of religious rules and prescriptions reached

the point of ostentatious piety. During this period, the phrase "legs must be covered even on a piano" appears.

Thus, etiquette changes decade by decade, and recently the concept of "etiquette" has again acquired a wide resonance. Many books have been published revealing the content of modern etiquette. The study of the behavioral structure of society has been introduced in various educational institutions.

Place and Role in Modern Culture

At the current stage of development of our society, social requirements for the emotional-spiritual and functional-business components of citizens' culture have increased. Nowadays, not only the general picture of mutual politeness is valued, but also the friendliness of tone, mastery of the etiquette word, and benevolence. One noble deed can please and encourage a person, awaken in them a reciprocal reaction of peacefulness and patience, and interest in communication.

From the birth of a child, parents should pay attention to and raise the child from a moral point of view. The family is the most active environment for forming the foundations of prudence – etiquette culture – in adolescents. It is a small state within a state. Laws and rules developed by the experience of many generations reign here. Family life and its etiquette can include a social essence, or they can represent a special phenomenon, as reflected in many works of classical literature. From the elder to the younger, features of the national character, the desire to know the beautiful in life, and the striving for the orderliness of everyday life are transmitted.

Now etiquette culture is observed by the majority of people, which can be seen in the simplest things: in the daily greeting, in the culture of communication with people, behavior in public places, at the table, and in the manner of dressing. Modern society today sets a "high bar" for us, which is growing more and more, and we must correspond to it if we want to be conscious, educated, cultural, and equal members of society.

Thus, modern etiquette inherits the customs of practically all peoples from ancient times to the present day. The peoples of each country introduce their own

amendments and additions to etiquette, conditioned by the social order of the country, the specifics of its historical structure, national traditions, and customs.

A well-mannered person knows the norms of etiquette, perceives them as a system of moral and aesthetic values, and adheres to them in their daily life. After all, the inability to behave appropriately among others, to respect, protect, and pity one another in everyday life leads to tensions and conflicts, nervous stress, deterioration of physical and mental health, and a decrease in work capacity and vitality. Modern etiquette culture teaches us to understand the general and the individual, and to be able to know and limit ourselves.

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Lohachov V. V.

DIGITAL LINGUISTIC EVOLUTION: A COMPUTATIONAL ANALYSIS OF LANGUAGE CHANGE IN ONLINE ENVIRONMENTS

Language Advisor – Asst.Prof. Shamrai O. V.

The rise of social media and digital communication has fundamentally altered how language evolves. Unlike traditional linguistic change, which unfolds gradually over generations, online language innovation can occur within days or even hours. Platforms such as TikTok, Twitter, Reddit, and Discord create dense, high-velocity communication networks where new forms spread rapidly and cross-platform interactions accelerate diffusion. Computational linguistics provides the tools needed

to observe these processes at scale, offering unprecedented insight into real-time language change (Eisenstein, 2013). This article explores several interconnected phenomena that illustrate how digital environments shape modern linguistic evolution.

Internet slang often originates in highly interactive digital spaces where users experiment with playful expressions, abbreviations, and memes. Platforms like TikTok and Twitter serve as incubators for linguistic innovation, while Reddit and Discord communities help stabilize and reinterpret emerging terms. Cross-posting, algorithmic amplification, and multi-platform user behavior facilitate rapid diffusion (Grieve, 2017). Computational methods such as frequency analysis, network modeling, and temporal mapping allow researchers to track how slang terms emerge, peak, and stabilize across ecosystems. These analyses reveal the influence of platform culture, community norms, and algorithmic visibility on which terms become widespread and which fade.

Emojis have evolved into integral components of digital language, functioning as emotional markers, pragmatic cues, and even substitutes for words. Their placement can modify tone, signal irony, or soften direct statements, performing roles similar to prosody in spoken language. Over time, emoji usage patterns shift as platforms introduce new symbols and communities develop localized conventions. Computational analysis enables the study of these dynamics by examining co-occurrence patterns, semantic clustering, and temporal changes. Emojis thus form part of a hybrid linguistic system that blends visual and textual expression.

Digital platforms shape writing styles through design constraints and algorithmic incentives. Character limits encourage brevity and compressed grammar, while engagement-driven recommendation systems reward emotionally charged or attention-grabbing language. Search-optimized content often includes repetitive keywords, whereas algorithm-optimized posts mimic trending formats. These pressures influence vocabulary choice, sentence structure, and discourse patterns.

Computational tools help identify these stylistic shifts by analyzing lexical diversity, sentiment patterns, and structural features across platforms.

Multilingual users frequently blend languages in digital communication, creating fluid linguistic boundaries. Code-switching online serves functions such as identity expression, humor, emphasis, and audience targeting (Androutsopoulos, 2015). Platforms like Twitter and Instagram provide environments where mixed-language forms thrive. Computational tools, including language identification algorithms and sequence modeling, enable large-scale analysis of code-switching frequency, patterns, and community-specific norms (Solorio, 2014). Platform constraints, such as character limits or trending topics, further shape multilingual practices, contributing to the emergence of hybrid linguistic forms.

Hashtags act as dynamic linguistic markers that evolve rapidly in response to social events. During major events, hashtags often undergo semantic expansion, shifting from literal descriptors to symbolic or political expressions (Zappavigna, 2015). Temporal analysis using time-series modeling, topic modeling, and sentiment tracking reveals how meanings diverge across communities and how competing narratives emerge. Hashtags guide collective discourse, shape public narratives, and influence the spread of ideas across platforms. Their evolution mirrors the life cycle of public attention and highlights the role of digital communities in negotiating meaning.

The vast scale of social media data enables automated detection of emerging linguistic trends. NLP techniques such as anomaly detection, clustering, and semantic shift modeling can identify new words, constructions, and stylistic patterns as they appear (Kutuzov, 2018). These models detect early signals of linguistic innovation by tracking deviations from baseline usage patterns. Automated systems also reveal how meanings evolve and how stylistic preferences, such as punctuation habits or narrative formats, spread across networks. This computational perspective provides insight into the mechanisms of language change and the cultural forces driving linguistic creativity online.

Digital communication platforms have transformed the landscape of linguistic evolution. Through slang diffusion, emoji usage, algorithm-shaped writing styles, multilingual code-switching, and hashtag dynamics, online environments continuously generate and reshape language. Computational analysis makes these processes visible, offering new ways to understand how technology, culture, and communication interact. As digital platforms continue to evolve, so too will the linguistic practices they foster, making computational linguistics an essential tool for studying the future of human expression.

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Lohin R. I.

FEATURES OF SPEECH PERCEPTION IN A FOREIGN LANGUAGE

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It should be noted that speech perception in a foreign and native language differs. The formation of articulatory skills and the reference base occurs in three stages: pre-speech, speech, and higher. At the first stage, the accumulation of sensory-motor speech images takes place. At the speech stage, articulatory programs are improved; during this period, the individual attempts to imitate the verbal behavior of adults, the movements of their lips. Physiologically, the ability for such imitation is conditioned by the work of mirror neurons. If at this stage of development the child does not learn to imitate, then, according to specialists, he will have problems with both the production and perception of speech. At the last stage, strong polymodal speech sensations are formed, which are unconscious and stored in memory as a set of phonological features. When learning a foreign language, the stage of pre-speech development of the individual is absent, which contributes to erroneous perception and the inability to hear and correct one's own pronunciation. And, what is especially important for this study, according to some researchers, errors in speech perception allow revealing differential features that are not yet sufficiently formed in his perceptual base.

The speech skill of pronunciation represents a complex system of articulatory actions, organization of breathing, and auditory feedback. When using the native language, as a rule, none of the components is realized by the speaker in the process of natural speech. From the point of view of a foreign language, each of the points

may present a difficulty. Pronunciation skills are part of the speaker's phonological competence, which in turn is a component of perceptual competence.

Perceptual competence includes the process of listening, understanding, and reactions accompanying the process of understanding or misunderstanding the message and the process of acceptance and reception (or non-acceptance and rejection) of the interlocutor.

Phonological competence, according to the document "Common European Framework of Reference for Languages: Learning, Teaching, Assessment" (CEFR), includes the knowledge and ability to perceive and reproduce:

• sound unities of the language (phonemes) and their variants (allophones)

• articulatory-acoustic characteristics of phonemes (for example, voicing, labialization, nasalization, etc.)

• phonetic organization of words (syllabic structure, sequence of phonemes, word stress, tones)

• prosody:

• stress and rhythm

• intonation

• phonetic reduction: vowel reduction, strong and weak forms, assimilation, elision of the final vowel.

Practically no clear and unambiguous criteria for assessing pronunciation exist. What to understand by correct pronunciation, in conditions where the pronunciation norm itself is quite unstable and depends on the region, is a very complex question. In connection with such variability of pronunciation, the question also arises: will a learner of normative BBC English be able to perceive Estuary English by ear, which is a mixture of Cockney and Received Pronunciation (RP), since in our terms, he lacks the corresponding perceptual base. Obviously, such a task will present some difficulties for him before he can adjust his "reference base" to this variant of pronunciation.

Modern orthoepic dictionaries have a sufficiently flexible position on the pronunciation norm, focusing on a certain modified "broad" model of RP and often give several variants of pronunciation with comments.

In most Ukrainian educational institutions, the British pronunciation norm RP or the American variant General American is taken as a standard. Students of linguistic specialties, as a rule, also study the features of the pronunciation of national, territorial, and regional dialects. We can assume that the speaker will perceive most simply precisely that variant which he studied and to which his phonemic hearing is tuned.

In this article, the concept of correct pronunciation will be interpreted slightly more narrowly; we will be primarily interested in the absence or presence of communicatively significant pronunciation errors, even if it does not correspond to the "perfect" pronunciation norm of RP. Thus, "correct pronunciation" will be understood as correct sound formatting of speech, which does not violate the transmission of meaning during decoding and does not hinder adequate perception of speech by the interlocutor.

In foreign literature, this term is usually designated as "intelligibility." According to classical linguistic classification, pronunciation errors can be divided into phonetic and phonological. Phonetic errors are not meaning-distinguishing and are expressed in the substitution of a phoneme with its allophone or variant. Phonological ones distort the meaning of the utterance and hinder its perception, that is, they are communicatively significant.

In this connection, we assume that it is precisely phonological errors in the speaker's own speech that will be critical for the perception of corresponding phonemes and words as a whole in foreign speech. Thus, for example, the absence of aspiration when pronouncing voiceless plosive consonants will most likely not be a problem in recognizing these phonemes, but the absence of opposition in tension/laxness may lead to difficulties.

Most errors in speech in a foreign language are associated with the phenomena of language interference, in our case, phonetic interference.

U. Weinreich distinguished the following types of phonetic interference: under-differentiation, over-differentiation, phonetic substitution, and reinterpretation (Вайнрайх, 1979). Under-differentiation represents a process where the speaker does not see the difference between two phonemes of a foreign language, for example, replaces [θ] with [s] in the word "think" or does not see the difference between long and short vowels and pronounces the words "deal" - "dill" identically. Over-differentiation is understood as a phenomenon where the speaker operates with differentiating features of the native language where it is impossible in the foreign one, for example, the devoicing of the phoneme [d] in the word "bend," leading to the loss of the tense feature of the English verb. There is also the phenomenon of phonetic substitution, but it refers to grapho-phonemic errors (that is, caused by ignorance of reading rules), and consequently goes beyond the scope of this work.

Guided by the types of phonetic interference listed above and the contrastive analysis of the phonetic composition of the Ukrainian and English languages, we will attempt to compile a preliminary list of phonological errors that may entail errors in perception. Obviously, the root of many distortions associated with under-differentiation will lie in the poorer vocalic system of the Ukrainian language and primarily in the absence of opposition in tension/laxness. Problems are possible in the pronunciation and perception of diphthongs. As for consonant phonemes, we assume that the following may become critical for perception: substitution of slit consonants [θ] with [s] or [f]; [w] with [v]; substitution of the sonorant [ŋ] with [n], devoicing of [d3] to [tʃ] and devoicing of voiced consonants in the final position. Separately, we note the pronunciation of silent consonants as a possible grapho-phonemic error. At the super-segmental level, the main problem is incorrect stress. We do not deny that ignorance of the intonation properties of the language or the inability to distinguish reduced forms in fluent speech can also lead to distortion of perception, however, the study of these phenomena is beyond the scope of this work.

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Luchko E. A.

INFLUENCE OF FOREIGN LANGUAGES

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Have you ever thought about how important it is to know foreign languages and how can it positively influence our lives? Let's start with the fact that approximately 1.5 to 2 billion people worldwide are learning English and the most shocking part is that English is not their first language. We can already see how huge this influence is, but things are so much deeper.

People start learning foreign languages for different reasons in spite of the fact that it can be hard and exhausting if you're not a native speaker. People chose this thorny way firstly because of the career opportunities. It becomes so much easier to find a highly paid job and have an impressive income. You can get extra money as a translator, tutor, guide or even a writer. Basically thousands of doors are open for you if you are a purposeful person who knows at least one foreign language, because people like this earn $128k more than ones who know only one language according to the statistics. For you to know, more than 50% of companies take language skills into account when hiring. Secondly, the process of learning a specific language which is new for you is an incredible start for improving yourself. Learning a second or third language can bring many benefits to a student’s future. For example, a positive impact on cognitive abilities. Professional opportunities, personal growth,

educational, social and cultural interactions. Studies reveal bilingual students have better working memory and powerful ability to multitask. It’s a fact that students like this can think more clearly, solve problems, and make better decisions in general. Speaking more than one language can improve problem-solving skills and develop creativity. It’s so much easier to live in our world if your brain adapts quickly for the new environment and perceives new information like it’s nothing. People like this are unstoppable and strong, because to be honest it’s hard to learn language when you’re not surrounded with it daily. Speaking more than one language helps to increase cultural understanding and empathy which are valuable personal traits. Understanding another culture’s customs and ways of communicating helps build better, stronger relationships with people from different backgrounds and become a flexible person at this point. Obviously, with these skills you get more self-esteem, confidence and pride for your achievements. Thanks to this you can find new trustworthy friends, smart business partners or even the love of your life from other countries if you’re able to speak some language fluently. There are plenty of stories when people started to get acquainted with a new language because of their true feelings for someone, with whom they had a language barrier. An important benefit is that you can travel without feeling alien and superfluous in another country and experience incredible vacations or business trips feeling like fish in the water. Probably the most important part of learning languages is educational advantages. For example, if you know how to express your thoughts in English, which is being studied almost everywhere in Ukraine, your academic performance will be wonderful and it doesn't matter if you study at school or at the university! Talking about universities, it’s a well-known fact that you have big chances to enter a college or university abroad and get a high profile education speaking the official language of the specific country. There are many exchange programs which change people's lives for good. I want to add that if you’re a polyglot, who knows more than two languages then your potential future prospects will increase significantly. You can easily become a valuable, respectable specialist in several countries, of course

provided that you put a lot of effort into your future and goals. Now you can see how powerful languages are!

I described a few benefits about the importance and greatness of the foreign languages, and I have some interesting information that I found out during my own way of learning languages. I knew two languages perfectly since my early childhood and when I was 6, my parents decided that English is gonna be useful for me in life, and they were 100% right. I really enjoyed learning this language when I was a kid and I gained basic knowledge back then, but it wasn't enough for me. At the age of 15 I realized what exactly I need English for and surrounded myself with it as much as possible. I completely immersed myself in the process of learning the language. I have been watching movies and TV series without translation, reading books and discussing different topics in English for hours. The main thing is that I never forced myself to do it, I tried to make this process exciting and educational at the same time. Now I can say for sure that in two years my English level became so much better. Thanks to English I entered university, where I started to learn another language - Spanish, which I enjoy learning so much. Except for this, I found a job that I love. I work as an English teacher for kids and feel like I am where I meant to be. I'm eternally grateful to myself for not giving up and not being a lazybone in my past. The time that I spent on learning English was certainly worth it. Now I look at the kids from the learning centre, where I work and I notice that they show impressive skills at such an early age. By the way, they are not only good at English, these kids also have shocking memory, huge imagination and developed brain. It is an obvious proof that the process of learning foreign languages makes you a better and smarter human being either when you're 40 or 4 years old. And trust me, the earlier you start, the easier it will be for you in the future.

To sum it up, the process of learning foreign languages is extremely influential in our modern world, because it gives mankind career opportunities, cognitive benefits, confidence, communication skills and cultural understanding along with appreciation and new achievements. Sure thing, it's not enough just to know a

specific language, you also need to find out how to apply this knowledge and how to implement yourself. In my honest opinion all of the efforts you put into this challenging activity will definitely pay off one day, especially if you feel motivated, energized, inspired and happy while you're learning a language. So, start to learn languages now and become the best version of yourself!

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Lvova D. V.

OVERCOMING COMMON CHALLENGES IN ENGLISH LANGUAGE LEARNING: PERSONAL EXPERIENCES AND STRATEGIES FOR SUCCESS

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The objective of this paper is to organize and clearly present the main issues encountered while learning a second or foreign language, specifically English. Based on empirical observations, the difficulties discussed here are very representative of the common barriers faced by people starting language study outside their native environment. Therefore, I chose to illustrate the main problems through my own experience.

This is a brief overview of my journey in learning English, as well as the primary motivation behind my pursuit of this language. My engagement with English began at the age of 13 and has continued ever since. Initially, I possessed minimal knowledge – only a handful of basic words – and encountered significant challenges like those faced by many individuals learning a new language. My first major obstacle was recognising the insufficiency of my understanding, coupled with a pronounced fear of making errors. While it is universally accepted that mistakes are an inherent part of human experience and essential for growth, overcoming this anxiety was pivotal.

A turning point occurred when I began working with a private tutor who employed an immersion-based approach. This guidance substantially enhanced the effectiveness and efficiency of my learning process. With strong support, I advanced rapidly from the A0 (Beginner) level to the B2 (Upper-Intermediate) level within approximately two years. The principal factor driving my progress was motivation. My goal was to fully comprehend native speakers, understand their intentions, and watch films in English without relying on subtitles. Ultimately, my primary objective was to achieve fluency in spoken English.

I would now like to share the approach I used to achieve this goal. Although I face ups and downs, it is the experience that helps me become more confident now. Therefore, attention will now be focused on the challenges I encountered while studying English in my first year. Ultimately, this analysis helps anyone learning a foreign language (whether it's English or another) to not only identify difficulties but also understand that these problems are universal. This provides students with a sense of support and confirms that the barriers they face are common and expected stages of learning, rather than a sign of personal failure.

One of the first major challenges I faced was memorizing new vocabulary. There are so many words in English, and at the beginning, they all seemed to just slip from my memory! Every lesson, I learned a bunch of new words, and trying to remember all of them made me nervous. I should have studied all the new ones, but

none of them were easy to remember. Some of them I had never heard in my native language and understanding them in another language was confusing for me. To overcome this, I started using a helpful technique: creating associations. By linking a new English word to a funny picture, a short story, or something I already knew in my native language, I found that I started remembering words faster and more easily. I read a lot of books where I could find these words, and the problem with remembering words disappeared. Although when that problem was solved, I faced a new challenge. Grammar was my nightmare because I often needed to understand complex rules. However, my tutor was experienced, so I made almost no mistakes.

Nevertheless, developing proficiency in speaking and listening continued to present the greatest challenge. Even after mastering vocabulary and grammar rules, many learners, including myself, struggle to form correct sentences spontaneously. This difficulty is like a "mental block", where the brain struggles to apply learned rules during real-time conversations. For example, my mind would freeze up when I tried to create proper sentence structures and use correct grammar. Learning words from a list or memorizing grammar rules in a notebook is one thing, but using them in actual conversation is totally different. There was a significant gap between my theoretical knowledge and its practical application. I was always worried that I would sound wrong or that others wouldn't understand me. This fear of speaking incorrectly often caused me to stay silent and avoid practice. Realizing that being passive was blocking my progress, I knew I had to make a change. So, I decided to take action. The first step was to create a safe space for practice.

An effective strategy was successfully implemented: engaging in self-talk. Every day, usually in the evening when I was alone, I would sit down and start narrating my day in English. I began very simply, almost like a diary spoken aloud. When I spoke to myself, I started using grammar that was familiar to me before and new words that I couldn’t remember earlier. I focused on that part, which I was scared might be the best way to help me change everything. As a result, this quickly became an important daily habit. By talking alone, the learner actively used the grammar and

new words that had previously intimidated them. This turned those anxious parts of the language into tools for controlled practice. Specifically, the method included asking and answering basic questions (e.g., "What did I do today?", "What did I have for lunch?").

Additionally, a key expansion of the learning environment involved integrating global communication platforms. I started making many new friends. I used language exchange platforms and forums to find conversation partners who were either learning my native language or were native English speakers willing to practice with me. I used popular apps that many people know and use today, such as Snapchat, Instagram, and TikTok. The results of this ongoing interaction were significant: after several weeks of daily practice with native speakers, I experienced a noticeable increase in my confidence and speaking speed. This reduced the previous "mental block", allowing me to construct sentences more easily. This strategy successfully built a network of supportive international contacts. And now I have some close friends who are really nice to me. They are always ready to help if I don’t know or understand something.

Although I encountered non-native English speakers, some of whom showed signs of performance anxiety, these learners were afraid of making mistakes, such as when speaking or writing. Nonetheless, their knowledge level was good. This collectively shows that a basic fear of making errors, whether in spoken or written communication, is a common psychological barrier that many understand but are reluctant to overcome.

People’s experiences clearly show that struggles with learning English, such as forgetting words, not knowing how to use grammar, and being afraid to speak, are common for almost everyone who learns a new language. Many students let their fear of making mistakes prevent them from practicing, which slows their progress. The main takeaway is this: these problems are not personal failures. They are normal and expected parts of the learning process. Once we accept that making mistakes is simply part of being human, we can practice freely and achieve fluency. We face

different struggles and problems while learning a new language, but our troubles are similar, and we can support one another. Everyone needs to remove any barriers to learning.

Unfortunately, few learners have the power to create change, and they struggle without it. So, we need to ask ourselves: Are we ready to make mistakes, and are we prepared to accept the inevitable ups and downs that come with the learning process? It has been proposed that foreign language learning should be served by combining the best of the analytic traditions of schooling with the life experiences and future needs of today's foreign language students (Thorne, 2008).

Like many language learners, I still encounter challenges, such as occasional issues with vocabulary recall or speaking. However, I am no longer afraid of these difficulties because I see them as a necessary part of my learning process. If I try to hide or ignore them, I won't see progress in my learning.

Ultimately, this resilience will lead to the desired proficiency. Every individual dedicated to learning English must possess a clear goal, as success is impossible without a definitive purpose. Therefore, each learner should establish their personal objective and commit to pursuing it. When troubles arise and motivation to study dips, the solution is to recall the initial goal and reflect on the progress already made. If you stop, you will never know where you could have been if you had continued. Every learner should have a goal that will help them through their troubles and support their continued learning.

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Medvid M. M.

DEVELOPMENT OF COMMUNICATIVE COMPETENCE IN EFL STUDENTS

Changes in social demand for foreign language proficiency necessitate new approaches to teaching, requiring a rethinking of existing methodological concepts and a search for rational methods that will optimise and intensify the process of foreign language teaching for EFL students with a view to implement the social function of language. We believe that the educational process should be based on an activity-based systemic-communicative approach, which includes both the development of educational and cognitive activities for mastering the language system and the formation of communicative competence, which includes linguistic, sociolinguistic, and pragmatic components.

The goal of developing communicative competence in the Common European Framework of Reference for Languages (CEFR) is defined as the ability and skill to use language in a variety of contexts, depending on specific conditions and needs, to carry out various types of speech activities, which include the processes of perceiving and producing texts related to specific topics in specific fields, thus emphasising communicative competence rather than isolated grammatical or lexical knowledge.

The key educational principles of communicative-oriented teaching methods are:

- stimulating cognitive processes;
- developing critical thinking skills;
- forming teamwork skills;
- developing leadership qualities;
- instilling a sense of personal responsibility and awareness of the need for lifelong learning;
- preparing individuals for successful activity in an information and post-information society.

The stimulation of cognitive processes means that students are expected to use their cognitive abilities to complete problem-solving tasks. Students are encouraged to use their experience, ingenuity and independence. Learning a foreign language is the key to intellectual development – most teachers and psychologists agree that learning a foreign language has a positive effect on the development of memory, logic and analytical skills.

The development of critical thinking skills is stimulated by tasks that enable students to move from intellectual-critical to socially-critical thinking. The aim of developing critical thinking skills is to help students learn how to find meaning in information, express and defend their point of view, and engage in productive exchanges of opinion.

Teamwork skills are developed through assignments that require, for example, processing information available to members of the problem-solving group in a measured manner, discussing it and reaching a collective decision. Responsibility for the collective work is taken by a student who reports on its results on behalf of the group.

In my opinion, instilling a sense of personal responsibility in the process of acquiring knowledge is achieved through educational and training tests and self-assessment tests, where the decision to complete them or not is made by students themselves, as there is no expectation of the teacher directly monitoring the completion of such tests.

Preparing individuals for successful activity in an information and post-information society involves not only solving professionally oriented tasks, but also developing the ability to adapt socially in a rapidly changing multicultural world, ecological thinking and behavior, and tolerance, since foreign language learning is based on the concept of cultural dialogue.

The main idea behind the communicative approach is that, in order to become effective users of a foreign language, learners must not only acquire knowledge (e.g. knowledge of grammatical, lexical or phonetic forms), but also develop the skills and

abilities to use linguistic forms for real communicative purposes. The goal of developing communicative competence is the ability and skill to use linguistic means in various contexts, depending on specific conditions and needs, to carry out various types of speech activities.

Despite the obvious effectiveness and promise of the communicative approach in foreign language teaching, there are also problems:

- excellent methods are offered, but there is a lack of coherence between different types of activities, and they do not create consistent progress in language learning; as a result, only a small number of particularly creative teachers can use them effectively;
- creativity is often confused with a lack of discipline, which leads to eclecticism in teaching methods; in most cases, communicative activities are simply a slight variation on more traditional activities;
- some teachers use these types of activities without adapting them to the group;
- many activities are linear and do not give students enough opportunity to express themselves in different ways or expand their repertoire of ways to express a particular idea.

The problems described indicate the need to train teachers who, without ignoring traditional techniques that have proven their effectiveness, would competently use a communicative approach based on methodological, technological and psychological aspects.

Thus, the development of the communicative competence of future specialists must be considered within the overall system of both students' and teachers' creative intellectual activity.

Mierenkov O. V.

TRANSFORMATION OF ENGLISH SLANG

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The term "transformation" is used in many areas of linguistics. Thus, in word formation, according to G. Kuprikova (Купрікова, 2014), "transformation" is understood as the formation of derivative words homonymous to their producers, i.e., the formation of words by lexico-semantic and morpho-syntactic methods of word formation. For a complete definition of the term "transformation", it is necessary to refer to various dictionaries. For example, a dictionary of linguistic terms gives the following definition (Мазурик, 2022): "Transformation" (from English transformation):

1) one of the methods of generating secondary language structures, consisting of a systematic change of basic models (or nuclear structures).

2) symbolically expressed morpho-syntactic correspondences between similar sentences and phrases found in a given corpus".

There exist the following types of transformations and techniques for their implementation:

1. Grammatical transformations. To this type, authors attribute such techniques as sentence restructuring, permutations, substitutions, additions, and omissions.

2. Lexical transformations. This includes the following techniques: omissions, additions, concretization, generalization, and substitution.

3. Stylistic transformations, which include descriptive translation, various substitutions, compensation, and synonymic substitutions.

A. Schweitzer, in turn, divides transformations into four levels (Волченко, 2015). His classification is complex for perception, therefore clarifications will be indicated in parentheses for convenience:

1) Transformations at the component level of semantic equivalence, which implies the use of such techniques as the replacement of some morphological means

by others, the replacement of morphological means by syntactic ones, the replacement of some syntactic means by others, the replacement of grammatical (morphological and syntactic) means by lexical and phraseological ones.

2) Transformations at the referential level, which include hyperonymic transformation (generalization), hyponymic transformation (concretization), interhyponymic transformation (replacement of realia), synecdochic transformation, metonymic transformation, metaphorical transformation (translation using an analogue, remetaphorization, i.e., replacement of one metaphor with another, and demetaphorization, i.e., replacement of a metaphor with a non-metaphor) and a combination of these transformations. This also includes complex transformations (antonymic translation, conversive transformations).

3) Transformations at the pragmatic level. At this level, the author suggests such techniques as the replacement of realia or allusions with their analogue, clarifying addition, explanatory or interpreting translation, translation compensations, replacement of some stylistic means by others.

4) Transformations at the stylistic level. Here, according to the author, one should attribute compression (omission of redundant elements, semantic contraction, lexical curtailment, ellipsis) or expansion.

Let us compare the generally accepted literary variant – the expression to be (to get) angry – to be angry – with possible slangisms (slang words) or colloquialisms borrowed by us from various dictionaries. We get the following picture:

to be as mad as one can be – to become furious

as mad as a wet hen (as mad as a hornet) – enraged, flying into a rage

to be foaming – to be furious, to be angry

to foam at the mouth – to fly into a rage (literally, "with foam at the mouth")

to be huffy – to be irritated

to be needled – to be in irritation (literally, "to receive a pinprick")

to get shirty – to get angry

like a bear with a sore head – very angry

Although this list of slangisms looks impressive, it is still far from complete, as it does not include a number of purely jargon variants. Regarding the translation of this list of words, the following points should be noted.

Some slangisms are contained in modern bilingual dictionaries, however, their translation cannot be recognized as sufficiently expressive. The expression "like a bear with a sore head" is recommended to be translated as "very angry", but the ordinary verbal construction "(to get) very angry" also means "(to become) very angry". In Ukrainian, the same translation is given, but in English, these are completely different things: a figurative phraseological unit (like a bear with a sore head), on the one hand, and a stereotype phrase (to get very angry) – on the other. There is an obvious attempt by dictionary compilers in some cases to limit themselves to stylistically neutral variants conveying only the general meaning of the phraseological unit. The work of finding sufficiently expressive and figurative shades of slangisms in the Ukrainian language falls on the translator himself.

Some inexperienced translators, orienting themselves toward such neutral, lifeless equivalents, avoid searching for more capacious, precise, expressive folk turns of phrase and, moreover, develop a habit of "translating neutrally". At best, such disclosure of phraseology by lexicographers leads the translator to a distortion of style. And sometimes the lexicographer's desire to transfer a colloquial word or phrase neutrally leads simply to a distortion of meaning.

A deeper psycholinguistic analysis of the translation of other slangisms in dictionaries only confirms our observation. Meanwhile, in the interests of professional translators, and primarily translators of fiction, the need for explanatory Ukrainian dictionaries of slang and colloquial expressions has long been overdue. Such a dictionary, like many English and American slang dictionaries, would greatly facilitate work on the word for both writers and translators of fiction, as well as the work of lexicographers. In the provided list, expressions corresponding to the English variant in the Ukrainian language are rarely encountered. For example, the English slang expression "to foam at the mouth" is literally translated into Ukrainian

as "with foam at the mouth". Such correspondences are encountered infrequently. The search for proper correspondence naturally takes a lot of time, and if lexicographers strive to find the optimal variant every time (for tens of thousands of the most difficult cases), they will not have enough time for the rest of the lexicographical work. The cited examples represent, so to speak, "classical slang". But what should a translator do in cases where the newest slang is used?

Let us assume that we need to translate the slangism "fixer" into Ukrainian. The dictionary gives many slang meanings of this word: "solicitor in shady deals'; "liaison between gangsters and authorities"; "drug dealer". However, recently the word "fixer" has acquired a new slang meaning: "a permanent post in front of a consulate building, school, or other institution for conducting round-the-clock security". Is a brief translation of it possible? No, it is impossible, since in the Ukrainian language there is no analogous slangism. However, in a number of cases, it is quite possible to give brief translations.

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Miroshnychenko D. V.

TRANSLATION OF STYLISTIC DEVICES IN ENGLISH POETRY FROM THE XVI-XIX CENTURIES INTO UKRAINIAN: CHALLENGES AND STRATEGIES

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Abstract. This article explores the complexities of rendering stylistic devices in English poetry from the Renaissance (XVI century) to the Romantic and Victorian Eras (XIX Century) into Ukrainian. Focusing on tropes, sound devices, and syntactic structures, it examines linguistic, cultural and prosodic disparities that pose significant challenges. Drawing on historical translations and contemporary analysis, the paper discusses adaptation strategies such as lexical and grammatical transformations to preserve poetic essence.

Introduction. English poetry from the XVI to XIX centuries, encompassing the works of William Shakespeare, John Milton, Alexander Pope, William Wordsworth, and others, is renowned for its intricate stylistic devices that enhance thematic depth, emotional resonance, and esthetic appeal. These devices include metaphors, similes, alliteration, rhyme, rhythm, inversion and parallelism. Translating such poetry into Ukrainian presents unique challenges. Ukrainian's richer consonant clusters, movable stress, and inflectional system differ from English's monosyllabic flexibility and fixed stress, often requiring structural adaptations.

Historical context. Translation Activity in Ukraine evolved alongside national literary development. In the XVI-XVII centuries, efforts focused on religious texts, with limited secular poetry. By the XVIII-XIX centuries poetic translations increased, influenced by Romanticism. Ukrainian translators like Ivan Franko and later figures adapted English works, incorporating folk elements to resonate locally. Soviet and Independence periods spurred original translations, such as Milton's

“Paradise lost” reflecting a decolonial push to reclaim cultural space from Russian intermediaries.

Stylistic devices: categories, strategies and challenges. Stylistic devices in English poetry serve multiple functions, from evoking imagery to structuring rhythm. Translation into Ukrainian must navigate linguistic asymmetries. Metaphors, similes, and personification often carry cultural specificity. For instance, English metaphors rooted in classical or biblical allusions may lack direct Ukrainian equivalents, leading to cultural mismatches. Challenges include preserving abstract connotations. In poetry, it is amplified as metaphors drive symbolic layers. E. G. Shakespeare’s “summer’s day” simile requires adaptation to Ukrainian seasonal imagery without losing romantic idealism. Sound devices, like alliteration, assonance, rhyme, and rhythm pose prosodic hurdles. English iambic pentameter relies on unstressed-stressed syllables, while Ukrainian’s dynamic stress demands adjustments, often extending lines or shifting to feminine endings. Rhyme schemes (ABAB in sonnets) may use assonantial links in Ukrainian for euphony, but consonant-heavy words can disrupt melody. Phonetic sounds like sound symbolism (repetitions for serenity) require compensation through Ukrainian clusters. Inversion, parallelism, and anaphora enhance emphasis in English. Ukrainian’s flexible word order aids transposition, but gender inflections and syllable count complicate parallelism. Challenges arise in maintaining rhythmic flow without syntactic awkwardness.

To overcome challenges, translators employ following transformations, that ensure stylistic coherence, with accurate translators prioritizing fidelity and free owns favoring naturalness. Lexical: differentiation, generalization, concretization and modulation. Grammatical: transposition, addition/omission and replacement. Combined: antonymic translation and total reorganization for cultural fit.

Conclusion. Translating stylistic devices from XVI-XIX century English poetry into Ukrainian requires navigating profound linguistic and cultural divides. While challenges like prosodic mismatches and cultural specificity persist, strategies

of transformation enable resonant adaptations. This process not only preserves literary heritage but enriches Ukrainian poetry, promoting intercultural dialogue.

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Morkova V. O.

SYNERGY OF PROGRESS: HOW SCIENCE AND CULTURE ARE SHAPING THE WORLD OF TOMORROW

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The modern world is undergoing unprecedented changes, driven by the interaction of science, culture, technology and tourism. Each of these areas is developing extremely rapidly, and together they form a complete picture of the future, which for us is no longer just a forecast, but a reality that is gradually coming true (Векленко, 2019). Examples from around the world show how science and technology deeply influence culture and tourism, changing our perception of humanity's capabilities.

One of the most ambitious international projects is the Artemis programme, initiated by the US National Aeronautics and Space Administration (NASA). Its key goal is to return humans to the Moon and prepare for future flights to Mars. The Artemis II mission is scheduled for April 2026 and will be the first human-crewed mission within this programme. Its crew will consist of four astronauts: Reid Wiseman, Victor Glover, Christina Koch from NASA, and Jeremy Hansen from the Canadian Space Agency. A ten-day flight around the Moon will test the Orion spacecraft and verify life support systems, including carbon dioxide removal, oxygen management, and crew protection in deep space. This mission will be the first step towards sustainable space exploration, which will inevitably influence the development of science and humanity's cultural self-perception. Just as the Apollo flights became a symbol of the technological power and culture of the era, Artemis is set to become a sign of a new era of international cooperation and space tourism.

In China, science is already being integrated into people's practical lives through artificial intelligence systems. One of the most important projects is the DeepSeek system, which has been actively implemented in more than ninety hospitals nationwide since 2025, including leading clinics in Shanghai. DeepSeek is used to analyse medical images, support clinical decisions, automate administrative

tasks, and translate test results for foreign patients. At Ruijin Hospital in Shanghai, this system analyses about three thousand pathological samples daily, significantly reducing the workload on doctors and speeding up diagnosis. This shows how technology is changing medicine, increasing its accessibility and quality. Another example is the Xiaoyi medical robot from iFlyTek, the first in the world to successfully pass the national medical licensing exam, proving that artificial intelligence can reach a level previously only available to highly qualified human specialists.

India demonstrates a different approach to combining science, culture and technology. The Traditional Knowledge Digital Library (TKDL) platform was created to digitise traditional medical systems – Ayurveda, Unani, Siddha, Sowa Rigpa and Homoeopathy. The use of artificial intelligence algorithms allows knowledge accumulated over millennia to be stored and classified, making it accessible to scientists around the world and protecting India's intellectual property. This approach demonstrates how modern technologies can create new solutions and help preserve cultural heritage by integrating it into the global scientific community.

European countries are focusing on integrating science, culture and tourism by developing the concept of ‘smart tourism’. In the cities of Gothenburg (Sweden), Helsinki (Finland), Linz (Austria), Ljubljana (Slovenia) and Matosinhos (Portugal), projects aimed at digitising the tourist experience are being implemented. This includes creating interactive maps and mobile applications that provide real-time information about cultural events, transport, and museums and introducing sustainable development systems, from electric transport to green energy solutions in the hotel business. For example, in Helsinki, tourists can use mobile platforms that integrate transport, cultural events and services, making travel convenient and environmentally friendly. This is a striking example of how culture, science and technology interact in tourism, creating new experiences for travellers.

It is impossible to imagine the future without tourism as an essential element of globalisation. Japan, for example, actively uses robotics in the hotel business,

where robot assistants serve tourists, providing them with information in several languages. Singapore is focusing on creating a ‘smart city’ where infrastructure is integrated with tourist services and digital technologies are used to ensure the safety and convenience of visitors. Canada is developing the concept of ecotourism, where technology helps minimise environmental damage while promoting indigenous peoples' cultural heritage.

Thus, examples from the United States, China, India, Europe, Japan, Singapore and Canada convincingly demonstrate that travelling into the future is a complex and multifaceted process in which science, culture, technology and tourism are inseparable. Space programmes are opening up new horizons for humanity, artificial intelligence is transforming medicine, digital libraries are preserving cultural heritage, and smart tourism is shaping a new quality of travel. All this shows that the future will be technically advanced, culturally rich, environmentally responsible, and focused on global cooperation.

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Nikiforova S. M.

TRANSFORMATION OF THE EDUCATIONAL PROCESS THROUGH INTERCULTURAL COMMUNICATION: EMPIRICAL FINDINGS AND PRACTICAL RECOMMENDATIONS

In the modern educational landscape, intercultural communication transforms not only the format of interaction among participants in the learning process but also the structure, content, and quality of learning itself. Globalization, the increasing cultural diversity in classrooms, and the growing role of digital platforms place new

demands on educational institutions: not only to transmit knowledge but to ensure conditions under which every student, from a different cultural context, has equal opportunities for learning and personal development. Transformation of this process requires a systemic approach: from revising learning materials and teaching methods to developing teachers' intercultural competence, implementing adaptive assessment forms, and creating inclusive learning environments.

This study's theoretical framework draws on concepts of intercultural communication as a process of encoding and decoding meanings in contexts where different cultural frames, norms, and expectations converge. It is crucial to understand that communication extends beyond verbal exchange to include nonverbal signals, contextual cues, and structural factors within the educational environment. Equally important is the perspective of intercultural pedagogy, which emphasizes the need for adaptability of instructional scenarios, consideration of diverse learning styles and cultural values, and the development of universal design for learning that is accessible to students from varied contexts. Within this work, three primary dimensions of transformation are considered: the material dimension (adapting instructional materials and modes of knowledge presentation), the procedural dimension (changes in assessment procedures and feedback), and the contextual dimension (balancing classroom atmosphere, institutional policies, and interactions with parents and the broader community).

This study's methodological foundation combines quantitative and qualitative approaches to comprehensively depict the impact of intercultural communication on the learning process. In the empirical design, surveys of students and instructors in multicultural classes were employed, along with a series of semi-structured interviews to gain deeper understanding of contexts and motivational mechanisms. Additionally, analyses of instructional materials, samples of feedback, and formats of assessment were conducted. Comparative analysis allows for identifying differences in learning activity, motivation, and academic performance across different cultural contexts, as well as assessing the impact of implemented inclusive

practices. The study also examines the role of digital platforms and asymmetries in access to resources in the learning process, given variations in technology availability and usage across contexts. These methodological choices enable triangulation to illuminate how material, procedural, and contextual dimensions interact to transform teaching and learning in multicultural settings.

Within the scope of the study, the issues of accessibility and equal access to resources are considered. Analyzing data from diverse cultural contexts, we find that asymmetries in access to digital platforms, materials, and support can substantially influence student learning activity and motivation. Various forms of support are highlighted, ranging from adaptive materials and content localization to organizing flexible learning schedules and ensuring access to technical resources. A key conclusion is that the transformation of the learning process requires a systemic approach, in which every element of the educational environment – materials, assessment procedures, instructors' competencies, and the culture of classroom interaction – is treated as part of an integrated system.

Empirical findings point to several key trends. First, adapting instructional materials to cultural contexts significantly enhances students' identification with the learning process, reduces cognitive load, and improves the quality of material acquisition. Second, feedback strategies that take into account cultural norms regarding criticism and autonomy achieve greater responsiveness and motivation among students. Third, the development of intercultural competence among instructors through professional training, coaching, and reflective practices fosters more inclusive and effective classroom interactions. These conclusions are corroborated by survey data, interviews, and analyses of instructional materials, which indicate improvements in learning quality due to the adoption of inclusive approaches.

Practical recommendations, drawn from the findings, are aimed at changes at the classroom and institutional levels. First, it is advisable to develop and implement adaptive materials that take into account linguistic features, cultural contexts, and

diverse learning styles. This may include multilingual glossaries, examples from different cultures, visual approaches, and a variety of content formats (video, text, interactive tasks). Second, establish feedback systems that combine individual consultations, group discussions, and digital platforms with opportunities for mutual peer review, to ensure accessibility and clarity of feedback for students from diverse cultural backgrounds. Third, invest in developing instructors' intercultural competence through professional development modules, coaching, experience exchange, and participation in intercultural communities of practice. Fourth, review assessment systems and implement blended and adaptive approaches: portfolios, Presentation-based projects, oral and written formats, which allow diverse expressions of knowledge and competencies. Such assessments should be transparent, with clear criteria, and account for cultural variability without compromising academic standards.

In summary, the transformation of the learning process through intercultural communication has the potential to significantly enhance the quality of education, provide more equitable opportunities for all students, and strengthen social justice within the learning environment. Implementing the proposed practical measures requires coordination among all stakeholders: instructors, administration, students, parents, and civil society organizations. It is important to create support systems that ensure the long-term sustainability of changes including resources for developing adaptive materials, platforms for exchanging experiences among instructors, and mechanisms for student feedback. Localization and scaling of approaches should be carried out with consideration of the specific context of the institution, the discipline, and the regional cultural landscape.

In the practical dimension, this primarily means the implementation of pilot initiatives in multicultural classrooms: the development of adaptive learning packages that provide multiple ways to access the material, the creation of a feedback system that takes into account cultural norms regarding critique and autonomous work, and the organization of training for instructors in intercultural competence. At

the same time, it is worth developing university and school policies that support flexibility in scheduling, access to technical resources, and the use of universal design for learning principles so that every student can effectively master the material regardless of their cultural background.

Empirical findings indicate that changes do not always yield rapid effects; they require time, systematic attention, and stable support from administrators. However, even in the short term, implementing foundational tools – balanced feedback, multilingual or adapted materials, and varied forms of assessment – can record increases in student engagement, improvements in the quality of educational interactions, and growing trust among participants in the educational process. An important contribution of this study is that its conclusions can be used to inform policies that support inclusive learning not only at the classroom level but also at the level of educational programs, universities, and regional development strategies.

The theoretical and methodological value of this study lies in the integration of conceptual frameworks of intercultural communication with applied empirical practice. This combination provides a more precise description of the mechanisms underlying successful interaction in multicultural educational environments and offers concrete actions that can be quickly adapted to diverse learning contexts. Following the implementation of the proposed changes, expectations are not only for improved academic outcomes but also for the development of intercultural skills among both students and educators, contributing to the formation of more open, resilient, and socially responsible communities.

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LANGUAGE PLAY AS A MEANS OF INFLUENCE IN ENGLISH-LANGUAGE ADVERTISING

In modern society, advertising is one of the most powerful mechanisms influencing human consciousness. It shapes needs, creates emotional images, and sets communicative standards. Since the advertising space is extremely saturated, companies actively seek ways to stand out and attract the audience's attention. One of the most effective tools for such differentiation is language play – the creative use

of linguistic resources, including puns, paradoxes, neologisms, alliteration, rhyme, and other stylistic devices. In English-language advertising, this technique plays a particularly important role, as English is rich in homonymy, has a flexible grammatical system, and demonstrates productive word formation, all of which open wide possibilities for creativity. As a result, an advertising message becomes not only informative but also entertaining, generating interest and forming a positive attitude toward the product or company.

The purpose of this paper is to explore language play as a means of influence in English-language advertising, to characterize its main types, and to demonstrate how such techniques contribute to brand recognition and strengthen communicative effectiveness. The paper provides examples of advertising slogans that illustrate the wit, innovativeness, and manipulative potential of language play.

One of the most common forms of language play is puns, built on homonymy or polysemy. For example, the coffee shop slogan *"Espresso yourself"* playfully modifies the phrase *express yourself*, hinting that coffee helps one express individuality. This technique creates a humorous effect, and humor in turn improves the consumer's attitude toward the brand. Another example is a pet store advertisement: *"Purr-fect deals for your cat!"*, where the word *purr-fect* is intentionally altered to evoke associations with a cat's purring. Such modifications make the text more lively and emotionally appealing.

Another effective device is alliteration – the repetition of identical sounds. English-language slogans frequently use repeated consonants to create euphony and enhance memorability. A classic example is the car company slogan: *"Safety. Security. Satisfaction".* The repeated initial *s*- reinforces rhythm and conveys a sense of stability and trust. Candy advertisements often feature lines like *"Sweet, smooth, sensational"*, where alliteration helps create a sensory, almost taste-related image of the product.

Rhyme also plays an important role, providing rhythm and fixing the message in memory. The battery brand slogan *"It lasts and lasts"* uses internal rhyme to

emphasize durability. Rhyme is also common in children's advertising, for instance: *"Play all day the happy way".* The text sounds light and playful, almost like a short poem, making it easier to perceive and remember.

English-language advertising also frequently employs intentional grammatical "errors" or non-standard syntax, creating the effect of rule-breaking and drawing attention. Apple's slogan *"Think different"* violates the traditional grammatical model (correct: *think differently*), but this very unconventionality makes it memorable and adds a philosophical undertone. Such devices help construct an image of the brand as creative, innovative, and capable of surpassing norms.

One of the most effective types of language play is the creation of neologisms – new words not found in dictionaries but easily understood from context. An energy drink advertisement might use a word like *"rechargeify"*, hinting at rapid recovery of energy. A laundry detergent brand could invent its own term: *"supercleanable fabrics".* These coinages not only attract attention but also give the product uniqueness and help form a brand-specific slang.

Intertextual references form another significant group – mentions of films, songs, famous quotes, or cultural symbols. For example, a tourism advertisement featuring the line *"May the tours be with you"* plays on the iconic *"May the Force be with you"* from *Star Wars*. Such allusions evoke associations with beloved cultural phenomena, enhancing positive reception.

Wordplay is often combined with visual play, where text and imagery interact. For instance, an orange juice advertisement with the headline *"Orange you glad you picked us?"* plays on the phrase *Aren't you glad*, while a bright orange is displayed beside the text. This combination creates a double effect, as humor is reinforced by the visual cue.

Language play serves not only as entertainment – it is also a tool of psychological influence. Unusual wording captures attention, breaks habitual perception patterns, and encourages rethinking familiar concepts. Moreover, creative slogans evoke emotional responses, increasing the likelihood of a positive consumer

reaction and building brand loyalty. In a competitive advertising environment, wordplay often becomes the key element that allows a company to stand out.

Thus, language play is a powerful means of influence in English-language advertising. It makes the text expressive, witty, and memorable; creates emotional connection between brand and audience; and helps establish a unique product image while attracting attention in conditions of informational overload. Through puns, rhyme, alliteration, neologisms, and intertextual references, advertising discourse turns into a game in which the consumer becomes not merely a recipient of information but an active participant. For this reason, language play remains one of the key tools of successful English-language advertising.

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STRATEGIES FOR TRANSLATING REALIA IN LITERARY TEXTS FROM ENGLISH

In modern translation studies, the problem of adequately rendering the national and cultural specificity of a literary text remains one of the most relevant issues. A special place in this process is occupied by realia – linguistic units that name objects, phenomena, events, institutions, and elements of everyday life that are characteristic only of a particular people or culture and are absent in another linguistic worldview. It is realia that act as carriers of national color and ensure the authenticity of the artistic space of a literary work. Through them, not only the external aspects of life are conveyed, but also the peculiarities of worldview, traditions, social relations, and the historical experience of a nation.

In translation theory, realia belong to so-called non-equivalent vocabulary, since the target language lacks full lexical correspondences identical in meaning, stylistic coloring, and cultural associations. This is precisely what determines the complexity of their reproduction. The translator finds themselves between two opposing requirements: on the one hand, it is necessary to preserve the national originality of the source text; on the other hand, it is important to ensure clarity and accessibility for the reader of another culture. In literary translation, this problem

acquires particular significance, as realia are closely connected with the creation of the system of images, the atmosphere of the work, and the author's individual style.

Realia perform several important functions in a literary text. First of all, they serve as a means of transmitting national and cultural information, through which the reader forms an idea of another country, the way of life of its people, traditions, and social norms. In addition, realia perform a stylistic function, creating an effect of authenticity and "immersion" into a different cultural space. Through them, the characters' personalities are revealed, their social status, their belonging to a certain historical era or national environment are emphasized. For example, in the sentence *He put on his kilt and took his bagpipes*, the words *kilt* and *bagpipes* immediately define the Scottish cultural context and shape the reader's perception of the national coloring of the scene.

The main difficulty in translating realia lies in the fact that the same unit may have different degrees of significance in different cultural systems. For a native speaker of English, such notions as *pub*, *Thanksgiving*, *college*, *high school* have clearly defined associations, whereas for a Ukrainian reader they may be insufficiently familiar or require explanation. The translation of realia connected with the educational system, public administration, traditional holidays, national cuisine, and everyday life is especially problematic. For instance, the notion of *Thanksgiving dinner* cannot be reduced merely to a "festive dinner", since it is associated with the history of the United States, family traditions, and a certain ritual character that has no exact equivalent in Ukrainian culture.

In the process of translating realia, the translator applies various strategies, the choice of which depends on the context, the genre of the literary work, the target audience, and the function of the realia in the text. One of the most commonly used strategies is transliteration and transcription, which consist in phonetic or graphic reproduction of a foreign word by means of the target language. This method makes it possible to preserve national coloring and the form of the word, but it does not always guarantee full comprehension of its meaning. Such words as *pub*, *jeans*,

cowboy, *sandwich* have already firmly entered the Ukrainian language and are perceived as common borrowings. For example, the sentence *They met in a small pub near the river* is adequately translated as *Вони зустрілися в маленькому пабі біля річки*, without losing either its semantic or its cultural content.

The strategy of calque is no less widespread. It consists in the literal translation of the structural components of a word or phrase. This method helps preserve the logical structure of the concept and makes it understandable for the reader. English lexical units such as *skyscraper*, *brainwashing*, and *iron curtain* are rendered in Ukrainian as «хмарочос», «промивання мізків», and «залізна завіса». In the sentence *The city was full of skyscrapers*, the calqued translation *Місто було заповнене хмарочосами* sounds natural and retains the imagery of the original. At the same time, it should be noted that not all calques are stylistically successful, as some of them may appear artificial or inconsistent with the norms of the target language.

Descriptive translation, or explication, is also widely used. It involves a detailed explanation of the meaning of a realia. This method is extremely effective in cases where, without additional clarification, the realia would remain incomprehensible to the reader. For example, *Thanksgiving* is translated as “a traditional American holiday”, *A-levels* as “final school examinations in Great Britain”, and *boy scout* as “a member of a children’s scouting organization”. In the sentence *They were preparing for Thanksgiving*, the translation *Вони готувалися до Дня подяки – традиційного американського свята* allows the reader to fully understand the content of the message. However, descriptive translation often leads to an overload of the text and disrupts its dynamics, which is especially undesirable in a literary work.

The use of a functional analogue is another important strategy. It consists in replacing a foreign realia with a notion that is functionally similar within the culture of the target language. This method facilitates perception but may lead to a partial loss of authenticity. For example, *college* is often translated as “університет”, *high*

school as “старша школа”, and *Santa Claus* as “Святий Миколай”. In the sentence *Children were waiting for Santa Claus*, the translation *Діти чекали на Святого Миколая* is clear and natural for a Ukrainian reader, though a certain degree of cultural adaptation of the image takes place.

Another strategy is generalization, whereby a specific realia is rendered by a broader, more neutral notion. This approach is frequently used when the specific detail is not essential for the development of the plot. For instance, *kimono* may be translated as “traditional clothing,” *SUV* as “a car”, and *cheeseburger* as “a sandwich”. Generalization simplifies perception, but at the same time it reduces the imagery of the text and weakens its national coloring.

A special place among translation strategies is occupied by omission, that is, the deliberate non-reproduction of a realia in the target text. This method is applied when the realia does not carry significant semantic load or when its repetition overburdens the text. Omission is most often used in dialogues or secondary descriptions. However, excessive use of this strategy may result in the impoverishment of the cultural background of the work and the loss of important semantic nuances.

The choice of a strategy for translating realia always depends on a number of factors, among which the genre of the literary work, its intended audience, the author’s style, and the function of the realia in the text play a particularly important role. In children’s literature, priority is given to clarity and accessibility, which is why descriptive translation and functional analogues are used more frequently. In serious literary prose intended for adult readers, transliteration and calque prevail, as they allow the preservation of the authenticity of the foreign cultural space. In the translation of historical novels, realia are especially closely connected with the depiction of a particular era; therefore, excessive generalization or adaptation is inappropriate here.

Thus, realia are important carriers of national and cultural information and represent one of the most difficult problems of literary translation. They require from

the translator not only a high level of linguistic competence but also profound knowledge of the culture, history, and traditions of the people whose language is the source language. There exists an entire system of strategies for translating realia, including transliteration, calque, descriptive translation, the use of functional analogues, generalization, and omission. Each of these strategies has its advantages and disadvantages and must be applied with regard to the specific context. The main task of the translator remains the achievement of an optimal balance between preserving national coloring and ensuring the comprehensibility of the literary text for the reader, which is the key to creating a full and adequate translation.

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ON THE BRINK OF PROGRESS AND DEGRADATION: HUMANITY'S CHOICE

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Human imagination has always sought to look beyond the horizon, painting utopias with interstellar flights or dystopias with ruined societies. Half a century ago, science fiction writers dreamed of technological wonders, but their gloomy predictions about social and cultural changes were closer to the truth.

Today, imagining 2075, we can see a world where the fullness of existence – a life filled with meaning, creativity, and freedom of thought – is lost forever. Humanity is ‘infected’ with standardisation, its consciousness ‘poured into a mould’ and ‘shackled by standards,’ unable to break free. Science, culture and technology deepen this process, creating a comfortable but empty world where robots and AI remain experiments, unable to restore the depth of being.

In the future, genetic engineering, such as CRISPR, will become the standard for eliminating hereditary diseases, allowing the creation of ‘perfect’ people with predetermined genes. 3D organ printing technology will make transplantation routine, and nanorobots in the circulatory system will prevent diseases before they even appear. However, the commercialisation of medicine will turn these achievements into elite privileges. Most people will rely on outdated treatment methods due to overburdened public systems. For example, telemedicine, which is already dependent on digital platforms, will become the only form of treatment for people with low incomes, but without human contact, it will turn into a cold, algorithmic process devoid of empathy. Doctors who rely on AI for diagnosis will lose their intuition, and patients will lose their trust in medicine, becoming a conveyor belt. Traditional medicine, based on traditions and human care, will disappear. Standardised protocols replace herbal remedies, ancestral recipes, and even simple human compassion. This is not just a loss of tradition, but a loss of the connection between people that once made medicine an art rather than a function. In

2075, the patient will become a number in a database rather than someone needing support.

Scientific progress will be held back not only by money but also by politics. Serious diseases such as cancer and neurodegenerative disorders will remain largely unconquered due to the high cost of research and the simplification of educational standards.

Adapting to mass demand, universities will produce specialists trained in algorithms rather than critical thinking. This will reduce the quality of research, leaving breakthroughs in the hands of a small circle of elite institutions working for global leaders. Geopolitical inequality will intensify: science will become an instrument of power rather than truth. Leaders will fund projects that strengthen their influence – from biotechnology to space programmes – while lagging regions will copy outdated technologies. For example, cheap production of solar panels or batteries using old methods will lead to environmental disasters in less developed areas, widening the gap between the rich and the poor. Instead of uniting humanity, science will become another barrier dividing the world into those who dictate the future and those who survive in it.

AI will become the basis for scientific progress, automating data analysis, modelling, and even writing articles. Algorithms will propose hypotheses, calculate experiments, and find solutions faster than humans. But this speed comes at a price: AI will supplant the non-standard thinking that has always driven discovery. Scientists, accustomed to ready-made answers, will lose their mental flexibility. For example, AI can predict the behaviour of a virus. Still, it will not offer a radically new approach to its treatment because it is limited by the patterns embedded in its database. The minds of scientists, constrained by standards, will become a reflection of algorithms rather than a source of inspiration. Science will become a tool for comfort rather than a path to truth, losing its full potential as a means of unlocking human potential.

As for culture, by 2075, it will be a shadow of its former glory (Кримський, 2003). Art, literature and fashion will be subject to mass consumption patterns created by algorithms. Platforms like MidJourney already generate paintings that copy classical styles but lack soul. By 2075, AI will develop exhibitions where each work is a variation on the past, without innovation. Literature will lose its depth: books written by AI will follow bestseller formulas, rewriting plots in the style of fantasy or science fiction without a spark of originality. National traditions that once inspired art will dissolve into the global flow. Music will become a set of sounds optimised for short clips on social media, and theatres and galleries will turn into digital platforms where AI decides what to show. Culture, once a source of inspiration, will become a conveyor belt devoid of human soul.

But the future does not have to be bleak and soulless. Yes, science, technology and culture carry the risk of losing humanity, but it is humans who can give them meaning. Every discovery, every innovation is just a tool in our hands. How we use them will determine whether the world in 2075 will be cold and standardised or, on the contrary, open to new ideas, cooperation and harmony.

The future may be when science heals the body and soul, culture once again unites people in diversity, and technology frees up time for creativity and development. Humanity has a chance not to lose itself, but to find a new depth of existence – where innovation is combined with tradition, and the pursuit of progress does not contradict love, compassion, and freedom of thought.

Thus, the journey into the future is a challenge and an opportunity. It is up to us whether it will be a world of soulless algorithms or a world where science, culture and technology help people realise their true potential.

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INTEGRATING ENGLISH LANGUAGE MASTERY INTO PROFESSIONAL PRACTICE IN INTERNATIONAL TRANSPORTATION

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English competence has become an increasingly critical and multidimensional component of professional preparedness in contemporary mobility and transport systems, where ongoing digitalization, the proliferation of multimodal communication channels, and increasingly sophisticated human-technology interactions demand from transport specialists not only advanced linguistic proficiency but also refined intercultural awareness, operational adaptability, cognitive resilience, and ethical judgement. The *relevance* of this article is underscored by the increasing globalization of mobility networks and the ongoing integration of advanced technological systems, including automated monitoring, predictive analytics, intelligent ticketing platforms, digital scheduling tools, and human-machine interfaces. These systems primarily operate in English and require a precise understanding to ensure tasks are completed correctly. In this context, English serves as the primary medium for coordinating international transport operations, maintaining safety standards, facilitating clear communication with passengers from diverse linguistic and cultural backgrounds, and ensuring overall accessibility across global transport networks.

The *purpose* of this study is to conceptualize English as a core professional competence that simultaneously serves as a linguistic, cognitive, and operational instrument, and to delineate pedagogical strategies that align language instruction with the real-world communicative, technological, and ethical demands faced by contemporary transport specialists.

Safety-critical sectors, particularly aviation and maritime transport, illustrate the urgent need for English proficiency, as internationally standardized phraseology has been shown to reduce miscommunication and operational errors, with regulatory bodies such as the International Civil Aviation Organization emphasizing that even

minor ambiguities in language use can lead to catastrophic outcomes (ICAO, 2025). Equally, urban and intercity mobility contexts, including bus, metro, rail, and passenger ferry systems, demand that staff are able to provide clear instructions, handle ticketing, offer route information, manage complaints, communicate emergency procedures, and support individuals with limited language skills, thereby demonstrating that English proficiency encompasses functional, social, and safety dimensions simultaneously (Machado, 2024).

A compact, well-chosen vocabulary helps travelers and workers alike, and important lexical sets for everyday needs include, for example, *ticketing* (*ticket, fare, pass, return*), *routing* (*route, platform, terminal, transfer*), *timing* (*schedule, departure, arrival, delay*), and *safety* (*evacuate, emergency exit, assembly point*). For professionals, additional terminology encompasses *logistics* (*manifest, consignment, customs*) and *technical transport terms* (*ATC – air traffic control, ETA – estimated time of arrival*). It's clear that learning phrases instead of just individual words is much more effective for language learning.

Transport English is inherently task-oriented: for passengers, key tasks include locating services such as asking for stations or ticket machines, purchasing tickets, understanding announcements, and requesting assistance. For staff, tasks include giving directions, handling complaints, making safety announcements, and managing delays. Training that emphasizes role-plays, like simulated ticket purchases, emergency announcements, or lost-and-found interactions, leads to faster and more lasting competence than decontextualized vocabulary drills. Educational resources that offer authentic dialogues and recorded announcements, such as airport or train station audio recordings, are especially beneficial for improving listening comprehension.

Technology both aids and raises expectations for language use, as mobile apps offer route planning, real-time delay notifications, and digital tickets, typically in English as the default or an optional language, requiring both interface literacy and proficiency in spoken English. Similarly, digital signage and automated

announcements frequently employ standardized English phrases to ensure clarity for international audiences. Therefore, transport operators should design messages with simple grammar, short sentences, and widely understood vocabulary to reduce ambiguity. Words are only one part of communication; tone, politeness formulas, and non-verbal signals are equally important, as cultural differences influence how questions, instructions, or requests are interpreted. For frontline staff, a mix of clear, plain English and culturally aware behavior, such as smiling, patient gestures, and checking understanding, enhances trust.

Training should include not only language forms but also intercultural scenarios, for instance, calming anxious passengers or assisting individuals with limited hearing in noisy environments. Methodologists recommend a structured learning pathway to improve skills and communicative competence for students and professionals, including:

1) Functional core first – learning 100–200 transport-specific phrases covering ticketing, directions, and safety for immediate practical utility;

2) Authentic listening practice using recorded station and airport announcements alongside role-play exercises to enhance auditory recognition and response speed;

3) Task-based workshops simulating real shifts at ticket booths, platforms, and customer-service desks to practice language under realistic time pressure;

4) Leveraging technology such as mobile apps, digital phrasebooks, and flashcards with spaced repetition while encouraging operators to produce simple, multilingual content and clear visual icons accompanying brief English phrases (Machado, 2024).

The continuous expansion of smart technologies in transport, including automated announcement systems, route planning applications, sensor-based monitoring, AI-supported scheduling, and digitally mediated passenger feedback systems, further situates English at the core of human-machine communication, as professionals must interpret real-time data, issue system commands, document

operational anomalies, coordinate emergency responses, and maintain consistent service quality using English-language interfaces. These operational realities underline the need for pedagogical approaches that are experiential, scenario-based, and contextually authentic, integrating tasks such as role-play simulations, virtual-reality-based operational exercises, collaborative problem-solving, and analysis of authentic recordings of announcements, instructions, and service dialogues, all designed to enhance communicative resilience, adaptive reasoning, and rapid, precise language processing under high cognitive load.

Moreover, English competence is inextricably linked to intercultural communicative awareness, as transport professionals frequently interact with international passengers, multinational teams, contractors, and regulatory authorities, all of whom operate under different cultural norms, expectations, and social conventions; understanding and negotiating these differences is central to maintaining trust, inclusivity, accessibility, and service quality. The strategic and practical importance of English also extends to professional development, as mastery of technical and operational vocabulary facilitates participation in international collaborations, access to technical documentation, engagement with research publications, and inclusion in professional training programs, conferences, and workshops, thereby enabling continuous knowledge acquisition and the implementation of best practices.

Considering these multifaceted demands, English education for transport specialists must move beyond isolated grammar and vocabulary exercises to embrace an integrated model that combines linguistic proficiency with technological literacy, intercultural competence, ethical awareness, and cognitive adaptability. Teacher preparation plays a crucial role in this model, requiring educators to develop domain-specific knowledge, methodological expertise, and the ability to design authentic, operationally relevant tasks. They must also monitor learners' progress in realistic simulations and provide targeted feedback that enhances both linguistic and professional performance. By situating English at the intersection of communication,

cognition, technology, and ethics, educational programs can produce professionals who can maintain operational safety, manage complex real-time interactions, support passengers' diverse needs, and sustain high-quality service under the pressures of contemporary mobility environments.

In *conclusion,* English has become a complex professional skill vital to modern transportation systems, serving as the main link that connects human decision-making, technological operations, intercultural communication, and safety. Mastery of English allows personnel to accurately interpret system data, efficiently coordinate diverse teams, provide user-centered services under tight deadlines or high mental demands, and communicate effectively within global transportation networks. It is also significant to highlight the importance of teaching methods that promote well-rounded skills through scenario-based learning, immersive simulations, real-world tasks, and reflective practices, thereby improving communication accuracy, adaptability, and ethical judgment. Ultimately, investing in quality English education enhances operational efficiency, reduces miscommunication, improves passenger safety and satisfaction, supports ongoing professional development, and contributes to the advancement of human-centered, inclusive, and tech-savvy mobility systems, which are vital to today's society.

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THE PRICE OF PROGRESS: WHAT WILL OUR FUTURE BE LIKE?

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Everyone has different views on the future and further development of humanity. Still, at the moment, it is impossible to imagine the world in ten years without the latest technologies and their further improvement. Nowadays, when computer technologies have flooded all spheres of life, looking back, we could not even predict how far development would go. Because of this, it is difficult to say what awaits us in the future, but we can be sure that it will definitely be more global than it is now.

We can already see how technological development has affected us, for example, artificial intelligence, which helps in learning, work, answers any questions, solves the most complex tasks in a matter of seconds, and even replaces a session with a psychologist for some people. The impact of AI on all areas is incredibly noticeable, so there is no doubt that in the future it will only improve its skills, but on the other hand, the question arises: 'Is it really that useful, and will it harm us in the future?' Artificial intelligence is everywhere, but some areas can never be replaced – human thinking and its associated professions.

Let's consider the development of culture in the future. Changes and the influence of new technologies are already noticeable. New styles have emerged, especially in art, such as VR art (Virtual Reality Art), Eco-art, NFT art (digital art), and Digital Art. Most of this is created using computer technologies, graphics programmes, and digital tools. Many museums and exhibitions organise virtual tours using VR glasses, so you can experience everything as if you were there in real life, even without being in the room. Every year, robots improve, paint their pictures, conduct tours, analyse data and more. All this proves the rapid development of technology. The future of culture will be full of new forms, even more unusual styles

that we cannot imagine will appear, and almost everything will be connected with technology, globalisation, and virtual shows.

As for AI and robots, even if they influence the further development of art, they will not replace honest human thoughts expressed in creativity: paintings, music, folklore. Artificial thoughts cannot replace all this, because creativity comes from within people, their experiences, beliefs and thoughts, which are unique. It is impossible to imagine how far development will go, but we can be sure that it will not be able to replace human creativity fully.

With global development, more opportunities are opening up for scientific research than in the last century. Significant discoveries are being made not only in computer technology but also in research itself. New vaccines, methods of treating seriously ill patients, plastic surgery, prosthetics – all of this is developing and becoming accessible to people with health problems. Such research is most beneficial to people, as incurable diseases eventually become curable. Nowadays, due to the war, many people have been wounded and left without limbs, but science does not stand still, and now prosthetics are being developed that make it easier for the injured to adapt to their new living conditions.

The future of science will only move forward, opening up new opportunities for medicine and research into space, the ocean, climate, new current topics, and more. Perhaps, in time, a cure for cancer and hereditary and genetic diseases will finally be found, regenerative medicine (growing organs for transplantation) will be developed, and prosthetics will become more accessible. Technology improvement is of utmost importance, as it is thanks to it that all other areas are growing.

It is thanks to the latest technologies that new equipment is appearing, AI is writing texts and helping doctors with diagnostics (Кастельс, 2007). In the near future, robotics can automatically perform everyday tasks without human intervention. People worldwide are fighting for the environment and its preservation, so almost all transport will likely become more environmentally friendly. In addition,

it will be much faster, as fully electric cars, trains, and drones are already being developed, which are much quicker than before and make life easier.

Culture, science and technology are interconnected and influence each other, so future changes will definitely be noticeable to everyone. People must learn to balance the virtual and the real, so artificial intelligence cannot completely take over all areas and replace humans. Progress will greatly help everyone, but it will also bring new problems that must be solved. All we can see about the future is that it will be fast, more convenient and straightforward in everyday life, bright, with global changes, environmentally friendly, and simultaneously with new obstacles.

Therefore, each period of our history is unique, teaching us to draw conclusions and avoid repeating mistakes. Looking to the future, we can already start influencing it and making the world better. For now, all we can do is observe and maintain balance, and above all, remain human under any circumstances, because no matter how far technology advances, it will never be able to replace us – our humanity.

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THE INTEGRATION OF ANGLICISMS INTO THE DAILY LEXICON OF UKRAINIAN YOUTH (2022-2025)

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The full-scale invasion of Ukraine in February 2022 triggered a sociolinguistic earthquake. For the younger generation (Gen Z and Alpha), this period has been defined by two simultaneous processes: a decisive "de-Russification" (the rejection

of Russian language and culture) and an accelerated "Ukrainization" of their vocabulary (Skokova, 2024).

The linguistic behavior of Ukrainian youth during this timeframe cannot be understood without first acknowledging the vacuum created by the rejection of Russian. For many years, it has served as a dominant *lingua franca* in the urban areas, most notably evident in the fields of gaming, music and street slang. The full-scale invasion resulted in the usage of the aggressor's language becoming morally and physically repulsive to a significant demographic that had previously navigated it with ease (Krouglov, 2025).

However, standard literary Ukrainian, with its poetic and archaic roots, did not always possess the immediate, agile, and technically specific vocabulary required to describe the realities of drone warfare, the logistics of volunteerism, and the nuances of mental health in a war zone. Into this lexical breach stepped English – the language of allies, of global support, and of the internet. This paper analyzes how Ukrainian youth have adopted and morphologically adapted these terms to create a unique wartime sociolect.

The most striking feature of the 2022–2025 lexicon is the migration of military terminology into everyday speech. A prime example is the rapid integration of the term "*drone*." Unmanned aerial vehicles became popular relatively recently, and the Ukrainian language did not have time to create its own term that would fully reproduce the semantics of this concept. The Anglicism "*drone*" quickly entered usage due to its simplicity and universality. Although the Ukrainian language has the partial equivalents *bezpilotnyk* (unmanned vehicle) or the acronym *BPLA* (UAV), these terms are more general and technical, covering a wide range of devices. In contrast, "*drone*" is associated in youth consciousness with specific images and functions, such as aerial filming or military operations (Chornyi & Chorna, 2024). Similarly, the Javelin anti-tank missile spawned the verb *dzhavelinyty* and the affectionate diminutive *Dzhavelinka*, effectively domesticating a lethal weapon (Levkova, 2023).

As the war shifted to drone warfare, the term "*Mavic*" – originally a brand of civilian drones by DJI – became a generic term for any reconnaissance quadcopter. Phrases like "Eyes in the sky" often rely on the specific technical capabilities of a *Mavic* (English-Ukrainian military dictionary, 2025).

Parallel to the military lexicon is the vocabulary of the volunteer movement, which mobilized nearly the entire youth population of Ukraine. The central term of this domain is *donat* (noun) and *donatyty* (verb), borrowed directly from the English "donate".

Prior to 2022, *donat* was restricted almost exclusively to the gaming and live-streaming communities (Twitch, YouTube), referring to tips given to content creators. In the context of the war, *donat* displaced traditional Ukrainian terms like *pozhertva* (sacrifice/offering) or *vnesok* (contribution). There is a meaningful distinction between the two terms. *Pozhertva* evokes a sense of loss, tragedy, or religious duty, whereas *donat* is associated with convenience of modern mobile banking and immediate result.

For Ukrainian youth, *donat* is inextricably linked to FinTech solutions like Monobank "jars" (*banky*). Associated with this is the specific usage of the word *zbir* (fundraiser), which is often paired with the Anglicism *deadline*. The latter is used with intense urgency in volunteer discourse: "We have a *dedline* to buy this Mavic before the brigade leaves for the zero line." The phrase "Terminovyi zbir, deadline zavtra" (Urgent fundraiser, deadline tomorrow) permeates social media stories.

The energy terror campaigns of 2022–2025 introduced technical brands into the domestic lexicon. The brand name *EcoFlow* (a manufacturer of portable power stations) underwent a process of "eponymization", similar to "Xerox" or "Google". In Ukrainian youth usage, *EcoFlow* became a generic term for any large battery or portable power station, regardless of the actual manufacturer (Bluetti, Jackery, or custom-made). The possession of an EcoFlow also became a major status symbol, signifying autonomy from the collapsing state grid.

Similarly, *Starlink* became synonymous with internet access in critical zones. To "be on Starlink" (*buty na starlinku*) implies having a connection that is independent of local blackouts. While Ukrainians were accustomed to *vidklyuchennya* (routine scheduled outages) or *avariya* (accident), the term *"Blackout"* itself was adopted to describe systemic, long-duration, or nationwide grid collapses caused by missile strikes. Using the English term perhaps distances the speaker slightly from the horror of the reality, as it is characterised by a technical term rather than a native description of cold and darkness.

A significant trend in Ukrainian daily speech is the "psychologization" of language, where English terminology is adopted to articulate the mental health crisis caused by the war. Youth increasingly use specific terms to define emotional boundaries and identify toxic behavior, such as "*abuser*" for controlling individuals, "*gaslighting*" for manipulation, and "*red flag*" for warning signs in relationships or situations. Additionally, the phrase "*not in resource*" (ne v resursi) has become a common calque from English, allowing speakers to precisely describe the state of being emotionally drained or lacking the energy to cope with daily stress.

Simultaneously, Ukrainian youth remain deeply integrated into global internet culture. While universal terms like "*cringe*" (embarrassment), "*bullying* " and "*vibe*" (atmosphere, mood) are used in standard contexts (Hnatyuk, 2025), other words have evolved darker, specific meanings; for instance, a "*quest*" now refers to difficult survival tasks like navigating a city during a raid, while "*GG*" (Good Game) has shifted from a polite way to end a match to a fatalistic declaration of hopelessness or enemy destruction. Similarly, "*copium*" is used to describe an attempt to pass off defeat as victory, and "*NPC*" (Non-Player Character) is used to dehumanize passive observers or Russian soldiers who blindly follow orders without agency.

As the war entered its third year, the lexicon began to reflect social friction. The Word of the Year 2024 candidate was "*Busification*" (busyfikatsiya). This grim neologism combines the English root "bus" (referring to the vans used by recruitment officers) with the suffix -yfikatsiya. It describes the forced mobilization tactics on

the streets (Myslovo Dictionary, 2025). This term marks a shift from the heroic Anglicisms of 2022 to the cynical lexicon of exhaustion in 2024–2025.

The integration of Anglicisms into Ukrainian youth speech is not a sign of linguistic corruption, but of vitality and adaptation. Crucially, the preservation of the Ukrainian language remains the most important goal. However, this study shows that "purity" does not mean isolation. The Ukrainian language is strong enough to absorb English words and adapt them to its own grammar, making them sound Ukrainian, like *donatyty*. Ultimately, every word spoken in Ukrainian – whether ancient or borrowed – is a victory against the enemy's attempt to silence it.

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HARMONY OR DECLINE: THE DILEMMA OF THE TECHNOLOGICAL WORLD

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Scientific progress is already changing our lives today, and this trend will only intensify. In particular, medicine will take on a completely different form. We have already seen examples of accurate diagnoses using artificial intelligence and gene therapy advances. The coming decades are likely to see the spread of personalised medicine, where treatment will be tailored to the individual characteristics of each person's body. This could significantly increase life expectancy and quality of life.

Biotechnology is a separate area of scientific development. This applies not only to medicine but also to nutrition. Alternative sources of protein are already being actively developed: lab-grown meat and dairy substitutes. In the future, such innovations may become commonplace and help overcome global hunger issues.

Space research is no less critical. Modern achievements, such as the launch of the James Webb telescope and the mission to Mars, prove that humanity is actively expanding the boundaries of knowledge. Perhaps future generations will witness the creation of colonies beyond Earth or at least gain new knowledge about the universe. Thus, the science of the future will serve a dual function: solving pressing practical problems and simultaneously opening up new horizons.

Many fear that technological progress will supplant culture. Indeed, modern people visit libraries and theatres less often, spending more time on social media instead. But, as history shows, culture constantly adapts to new conditions.

In the future, cultural life will become increasingly integrated with digital technologies. Online libraries, virtual museums and digital theatre productions will become accessible to everyone. This will make the cultural space more open: residents of small towns can access world art as easily as residents of the capital.

At the same time, traditional forms of culture will not disappear. Live concerts and performances will always be special because they offer unique emotions. In the future, as it is now, these events will remind people that culture is not only information, but also experience, community, and emotional connection.

Another important aspect is the role of culture in preserving identity. In a globalised world, losing a sense of uniqueness is easy, as information flows unite people in a single space. It is culture that will help preserve diversity. It will act as a kind of ‘anchor’ that will keep people rooted in their history, traditions and language.

Technological progress is perhaps the most visible part of the future. It has already changed our lives: smartphones, the Internet and electronic payments have become the norm. These changes will only accelerate in the future (Фрідмен, 2002).

First and foremost, this concerns transport. In the future, we will probably switch completely to electric cars and driverless vehicles. They will reduce the accident rate and help minimise environmental damage. New-generation high-speed trains will also be actively developed, allowing us to travel long distances much faster.

Another area is innovative technologies in everyday life. Smart home systems already exist today and will become commonplace over time. Imagine a house that controls its temperature and lighting, saves energy, and orders groceries. This will undoubtedly make life more comfortable, but at the same time, it may increase people's dependence on technology.

Automation will also change the labour market. Many professions will disappear, as robots and computer programs will perform tasks faster and cheaper. However, new professions will emerge related to data analysis, technology

development, and control over their use. This means that the future will require constant learning and adaptation.

Along with opportunities, technology also brings threats. Already today, there are problems with cybersecurity, privacy, and dependence on social networks. In the future, these challenges will become even more serious. Therefore, the development of technology must be accompanied by ethical restrictions and a responsible attitude on the part of society.

Looking at science, culture and technology separately, one might understand that each is developing in its own direction. However, real success is only possible when these three areas are combined. Science provides new knowledge and discoveries, technology makes them useful in practice, and culture maintains spiritual balance and reminds us that we are still human beings, not machines.

In my opinion, the future will depend precisely on this balance. If we develop only technology, we risk losing our humanity. If we focus only on culture, we may fall behind the rest of the world. Only the harmonious development of all three areas will allow us to create a society that is both progressive and spiritually rich.

Therefore, the future should not be imagined only as a world of fantasy or catastrophe. It is rather a continuation of the processes we are already seeing today. Science will help fight disease and solve global problems, culture will preserve our identity and provide space for creativity, and technology will make life easier and open up new opportunities. At the same time, each area will bring its challenges: medical and ethical dilemmas, cultural changes, privacy issues, and unemployment.

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AI IN LANGUAGE EDUCATION

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Introduction

In our time, artificial intelligence is developing very quickly and rapidly and is gaining more and more popularity among young people in various spheres of life. But the most special place among them is occupied by the language sphere - it is here that AI demonstrates the ability to work with language analysis, generate full-fledged text and live dialogue. Scientific studies (Cambridge University Press; ScienceDirect; ERIC) confirm that the integration of AI has significant potential for improving the quality of language education, as well as overcoming such problems as: the mass nature of the educational process, lack of teachers' time and the need to personalize learning.

Despite the obvious advantages of using AI, there are also some disadvantages. First of all, there is the problem of traditional pedagogical methods. Teachers and students have concerns about reducing the role of the human factor, dependence on these systems and reducing the originality of future works. But, as research shows, the competent implementation of AI together with classical methods can provide higher learning efficiency.

Therefore, the main question of this article is how to optimally integrate AI into language education in order to preserve both pedagogical value. And to strengthen learning opportunities.

Artificial intelligence is a large field of technology that allows machines to perform “human” tasks: analyze information, learn from experience, make predictions and generate new content. Machine learning is a part of AI, where systems improve themselves using data and complex algorithms. And generative AI (such as ChatGPT or Gemini) is able to create from scratch – write texts, draw images or create music at your request.

Modern AI models include:

1. ICALL (Intelligent Computer-Assisted Language Learning) – intelligent learning systems;

2. Chatbots and virtual tutors (ScienceDirect);

3. ASR (Automatic Speech Recognition) systems that analyze pronunciation;

4. Generative models that create language tasks, tests, or explanations;

5. Analytical platforms that determine student progress and correct the material.

Practical AI Tools and Their Applications in Language Learning

One of the key advantages of AI is the ability to adapt learning material to the individual style, pace, and level of the learner. Platforms like Duolingo, MyEnglishLab, Grammarly, or Lingvist create personalized exercises, collect performance data, and suggest the best learning path. The article "Artificial Intelligence in Language Learning" (ScienceDirect) states that such systems significantly increase the effectiveness of students' independent work.

Developing speaking skills with AI

– *Listening and pronunciation*: Automatic speech recognition (ASR) technologies, according to De Gruyter Brill, are able to record students' oral speech, detect pronunciation errors, and provide instant, detailed feedback. This opens up opportunities for independent speaking practice without the direct participation of a teacher.

– *Writing*: Tools like Grammarly, QuillBot, or large generative models help improve written work by checking grammar, style, logic, and structure. However, the ERIC study warns that overuse of these systems can reduce creativity and lead students to become dependent on automated prompts.

– *Reading and vocabulary*: AI is used to create personalized, tailored texts of varying difficulty, automatically generate glossaries, animate explanations, and highlight key terms. This stimulates cognitive development, including skills in analyzing and summarizing information.

– *Dialogue and speaking*: AI-powered chatbots offer an effective platform for practicing dialogic speech through simulations, role-playing, and interactive scenarios. A systematic review by ScienceDirect confirms that these tools significantly expand the opportunities for practicing speaking.

Advantages and disadvantages of implementing Artificial Intelligence

The use of AI has the following *advantages* in language education:

1. Increasing motivation – due to interactivity
2. Accessibility – the ability to learn anytime and anywhere
3. Personalization – adaptation to a specific student
4. Stimulating critical thinking – because students analyze, compare and improve skills.

However, despite these advantages, the use of AI also has some *disadvantages* and in some cases risks:

1. Ethical issues - confidentiality, authorship may be at risk
2. Risk of reducing the originality of your work
3. Dependence on technology, which simply weakens your thinking
4. Lack of special criteria for evaluating content created with the help of AI (for example, videos are gaining popularity, where it is impossible to understand at first glance that it was created with the help of AI)

Promising research directions

The key vectors of further scientific and methodological work in the context of the application of AI in education are:

1. Development of unified ethical norms and recommendations for the integration of AI into the educational process.
2. Official integration of AI technologies into state educational standards and curricula.
3. Formation and development of new digital competencies in the teaching staff (digital pedagogy).

4. Technological improvement of ASR- (speech recognition) and NLP- (natural language processing) systems to ensure maximum accuracy of speech analysis.

5. Creation of methods for assessing students' learning outcomes obtained with the involvement of AI tools.

6. In-depth study of the long-term impact of generative AI on the formation of critical and creative thinking of education seekers.

Conclusions

In this study, we did not just analyze the possibilities of AI - we saw a real tool for transforming language education. Artificial intelligence is not a temporary trend, but a powerful catalyst that personalizes learning for each student individually, helps improve their language skills and significantly relieves teachers from routine. AI is able to bring the quality of language learning to a completely new level.

Of course, we also found disadvantages: ethical dilemmas, the risk of technological dependence and a threat to originality and thinking. This means that the blind use of technology is the worst path a person can choose for themselves.

Thus, the significant potential of using AI in language education can be realized only through a balanced combination of innovative technologies with traditional pedagogical values. The future lies in a hybrid approach that combines technological progress with responsible pedagogical practice.

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MEMES AS A MODERN FORM OF COMMUNICATION

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Language as a means of communication constantly seeks the optimal form for transmitting thought, since most people spend a long time in social networks. With the development of information technologies, ideas, images, and cultural objects began to appear and spread increasingly often in the space of social networks through blogs, chats, online magazines, online broadcasts, etc. Any person chooses which source of information to consider reliable. Internet memes deserve special attention – concise emotional messages that are often a way of transmitting information, capable of reproducing the main meaning, defining the importance of a certain topic.

A meme is any witty short information (phrase, image, sound sequence, video) of an ironic nature, which reproduces a certain attitude toward some events or circumstances, and spreads on the Internet. As an example – an atypical joke, a politician's slip of the tongue, a caricature, a gesture, a short video of a curious situation. The most popular are Internet memes in the format of an image with an apt humorous text explanation.

According to Cambridge Dictionary definition, a meme is an idea, behavior, or style that spreads by way of imitation from person to person within a culture, often for expressing a certain phenomenon, theme, or meaning of the meme. Thus, memes are not only a funny gif, photoshopped image, or sticker. A meme is a peculiar unit that transmits ideas, symbols, or practices with the help of oral speech, graphics,

movements, etc. In a broad sense, a meme can be popular clothing, scientific hypotheses, artistic works, religious practices that are imitated/used by many people.

The term itself and the concept of the meme were proposed back in 1976 by Oxford University professor, biologist Richard Dawkins in the work "The Selfish Gene". The scientist noted that the transmission of cultural heritage is analogous to the transmission of genes and drew an analogy between genetic and cultural evolution and the existence in the latter of particles capable of replication (self-reproduction, self-copying, and transmission of information), which genes are in living nature. That is, memes are certain cultural information that grows into a social phenomenon due to transmission from person to person. The term "meme" comes not from the English "memory", but from the term "memetics" (theory of cultural evolution). In the eighties of the 20th century, a science about memes appeared – memetics. It studies memes through the prism of evolutionary-genetic models, that is, investigates their reproduction, distribution, selection, mutation, and recombination. Memetics, following R. Dawkins, considers memes as genes that can mutate during reproduction (Dawkins, 1976).

Thus, by the concept of a meme, we understand a certain semantic unit capable of transmitting information and reflecting emotional reactions during communication. The informational content of each specific meme affects the probability with which it will be copied.

The main goal of a meme is to give emotionality to the message, which will significantly contribute to its memorization and dissemination, because it is emotional coloring that emphasizes the content embedded in the message. The task of memes is not the consolidation of information useful to us, but the consolidation of that information which will allow them to spread and reproduce further.

Memes as a form of communication perform several important functions:

- representative: reproduction of what is seen, read, or heard with an appropriate emphasis on certain information;

- communicative: reaction to a situation generating a discussion, as well as the creation of a special linguistic space understandable for a certain group;
- creative: reproduction of events of reality in a creative format using modern online tools.

Internet memes are fleeting in time, as they do not require long contemplation. An Internet meme has a characteristic viral distribution among network users both through messaging and by including text or images in articles, short videos in a video sequence. Internet memes can be realized by different sign systems – both as a certain text and as an image. The overwhelming majority of text Internet memes are words, phrases, or sentences that have grammatical signs of a turn of phrase; however, in Internet communication, text Internet memes larger in volume occur. For an image, a drawing, a frame from a film, a cartoon, a graphic caricature, a cartoon, a photoshopped image, etc., are often used.

When creating a meme, it is important to consider certain principles. An informational component is necessary. At the basis of a meme can be a certain phrase, a controversial issue, a formula, an aphorism, etc. A meme is a concise meaningful phrase that has a humorous shade, understandable and close to a certain group of people. No less important is the emotional component. The meaning of a meme is humor, emotional closeness of the combination of the image and the text component for a certain representative group. Also mandatory is the presence of a certain paradox, a new meaning of the well-known. This can be a play on words, an oxymoron, a metaphor, or a figurative meaning of words, that is, situations when a certain phrase acquires a new atypical meaning.

Successful memes spread quickly and live long, while unsuccessful ones, on the contrary, disappear. If a meme attracts attention to its executor, then it will live longer; if it repels people, then it will disappear faster.

The aggregate of memes of one person is called a menome. A memeplex is a group of memes that live in symbiosis and reinforce each other.

How can memes and memetics be useful? Firstly, a menome, that is, a set of memes, characterizes a person. Memeplexes operated by a user will testify to his general interests, preferences, priorities.

Secondly, in information technologies and wars, memes are quite a common type of weapon. During the presidential campaign of D. Trump in 2016, his headquarters actively used this instrument. V. Zelensky's pre-election slogans were also designed with an aim at memetic virality ("no promises, no apologies", "spring will come, we will be jailing").

Internet memes, unlike non-Internet ones, have two key properties:

• significantly higher virality (the speed of spreading Internet memes is simply instantaneous; in a matter of hours, a meme can fly around the whole country);

• their life cycle is shorter (the speed of distribution contributes to quantity; Internet memes multiply just as quickly and displace one another).

For creating memes, new tools appear on the Internet. Now hosting for short videos Tik Tok is rapidly gaining popularity, allowing overlaying music, editing, and filtering images. Today Tik Tok cultivates whole viral colonies of memes.

Due to virality and "ubiquity", Internet memes have a significant impact on the aesthetics of the information field. They spread so rapidly that it is impossible to dissociate oneself from them (we do not take Internet abstinence into account).

The reason that memes are increasingly used in communication is that the people sending them do not need to spend time and mental resources to select words reflecting their mood or reaction to the interlocutor's previous message. In this context, the advantage of memes over smileys and emojis is that they are more diverse and thanks to this one can select exactly the one that most accurately reflects the emotional state.

Accordingly, the threat of such use of memes is the neglect of communication culture, that is, by using pictures more and more, people will use words less for the independent formation of thoughts, which can lead to the general degradation of personality, especially if it is a teenager.

On the other hand, memes force interlocutors to think extraordinarily in order to pick exactly such a meme that will not only reflect the emotions of the sender but also force other participants in the conversation to feel certain emotions as well. It should be noted that sometimes there are cases when a person simply cannot reflect his emotional state with words and another form of presentation is simply necessary.

Thus, in the course of the work, it was established that memes, as a new form of communication, influence a person and his communication. Undoubtedly, the development of information technologies has influenced the spread of memes in modern communication and given them significantly different and new forms. The role of memes in modern public life is extremely important. For they not only transmit information, although this function is not the main one, they help promote certain ideas, views, or thoughts. Joining political programs, memes participate in public life. Memes join the formation of public opinion, prompting us to certain actions.

The conducted analysis testified that Internet memes are characterized by reproducibility, integrity of components, and the possibility to change and combine with each other. Emotionality as the main factor of this communicative unit contributes to its rapid perception and memorization. The ability to reflect events of socio-political life and spread quickly on the Internet emphasizes that memes play both a communicative and a social role. The appearance of a large number of memes in the space of social networks is evidence that Internet communication is an integral feature of the communication of a modern person.

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THE IMPORTANCE OF CONTEXT IN TRANSLATION

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Translation is not simply replacing words from one language with their equivalents in another; it is a complex process that involves understanding meaning, intent, and the communicative situation. One of the most important factors determining the success of a translation is context. In translation theory, context refers to the set of circumstances, linguistic elements, cultural factors and situational conditions that fill the text and influence its interpretation.

Of course, without a proper understanding of the context, even a linguistically accurate translation may not convey the desired meaning.

It is generally agreed that when translating, context is essential. An individual word, such as "key" (to a door? on a keyboard?) cannot be translated in isolation, unless the target language happens to maintain the same ambiguity as the source language (Trans-Int.org., 2025).

The importance of context can be observed in all types of translation, including literary, legal, technical and media texts. In these theses, I propose to explore the significance of context in translation, types of context, and how translators use context to achieve equivalence and communicative effectiveness.

Context has very close connection with translation especially with literary translation. In literary works, context has an important function restricting translation process, and in turn translation, to a large degree, depends on context. Context is indispensable for translators to correctly understand the original text and to achieve functional equivalence in translation (Atlantis-Press.com., 2015).

Literary translation demonstrates the most obvious role of context. Authors often use metaphors, symbols, and cultural references that cannot be understood literally. Understanding the context is essential for conveying the author's intent, emotional tone, and stylistic nuances.

For example, a metaphor referring to a local holiday may be incomprehensible to foreign readers. In this case the translator may: attempt a literal translation but rely on context to hint at the meaning; use cultural adaptation by replacing the reference with a similar concept in the target culture; add a note or explanation to preserve authenticity. In all cases, the translator relies heavily on context to make informed decisions, balancing fidelity to the original with comprehensibility for the target audience.

Context is indispensable in translation. It determines not only the meaning of words and sentences, but also the communicative purpose, cultural resonance and functional accuracy of the translated text. From literary and idiomatic translations to legal and technical texts, understanding context ensures that translations are not only linguistically correct, but also effectively convey the desired message.

Contemporary translation theory increasingly emphasises context as a multifaceted concept that encompasses linguistic, cultural, situational, and historical aspects. Translators must carefully analyse context and apply appropriate strategies to preserve equivalence and clarity. Without context, a translation risks becoming literal, misleading or culturally inappropriate, undermining its purpose.

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USE OF MEMES IN SOCIAL NETWORKS

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The purpose of this study is to analyze the connection between memes and social changes. You probably see "Demotivational posters" (for example, "Never give up!") or pictures of a cat with funny captions in social networks every day; perhaps you even share such images with others. These are examples of memes – various images with words that ridicule cultural or social norms and which can repeatedly change meaning as a result of further changes. At the same time, they may not change the world, but they affect different spheres of activity and society.

Today we use memes in the most diverse circumstances. They help us establish contact with each other, can serve as a conversation starter, and even help smooth over a conflict or express a point of view.

Memes also help us relax when we try to distract ourselves from stressful situations. This is a free form of entertainment that can always be used, even if you do not have time for more time-consuming hobbies. Moreover, making them is simple enough for them to penetrate into the most diverse circles of society, being such ideal "pieces" of culture and humor that they mix together to create "viral" content.

Also, memes can influence how we interact with other people. Some parts of meme culture have caused unrest outside the Internet. After all, behind every meme stands a creator with the intention of publishing a viral message, whether for entertainment or persuasion.

How do memes affect society and how do social changes affect the evolution of memes?

1. Memes cover various environments and genres.

As meme culture becomes more widespread, it also becomes more complex. Before the Internet, memes evolved from poems, catchphrases, and cartoons. Today, memes relate to various parts of culture and are used in many different environments.

2. Memes are easy to understand.

Every meme reflects a specific cultural context and, as a rule, is based on some knowledge or opinion about the world. Some memes arise as a reaction to books, music albums, or cultural events, such as the Oscars. Existing memes can also become a solid foundation for creating new memes.

At the same time, it is important to note that there is no prerequisite for creating a viral meme. Any person can become a meme creator with a few clicks of a button, so this hobby is very popular.

3. Humor helps cope with stressful situations.

Although most memes contain some share of surrealism, they often relate to real-life situations. Relationship problems, conflicts between parents and children, and poverty are popular meme topics. There are memes describing stress in high school and academic circles; there are memes about workplace fatigue. Meme culture also takes on responsibility and anxiety for the state of the world. They give people a simple way to talk about shocking events.

Memes give us a way to express difficult thoughts. There is also an element of community. Sharing memes can give people a sense that they are not alone in their struggle.

But memes can also harm… It is important to consider that memes can be used both for bullying and for inciting hatred and disinformation among various social groups.

Memes can become propaganda. Memes are increasingly used in politics. This makes memes an effective tool of propaganda. Experts say that the simplicity of memes makes them an effective way to spread political ideas. This is true for various ideologies and groups across the political spectrum.

Memes can be used to provide simple answers to complex questions, which can be perceived positively.

In addition, memes evoke an emotional reaction, especially when shocking humor is used in them. This is one of the reasons why they are particularly attractive

to hate groups. Memes are often used to spread aggressive messages. And again, memes may seem ironic, but the damage they cause is real.

Conclusion. Like many other aspects of online culture, memes can be misunderstood by those who do not use them regularly. Some consider them completely inappropriate. Others believe that memes are dangerous and harmful to our communication.

Memes are a communication tool, and they can be used for the most diverse purposes. They can promote positive social changes, but they can also be used to the detriment of others. It is important to develop a realistic idea of the power of memes as a means of communication now and in the future.

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ONE WORD – DIFFERENT WORLDS: SEMANTIC VARIABILITY OF TERMS IN ARTISTIC AND TECHNICAL FIELDS

The lexical system of a language is a dynamic and multi-level structure within

which the same word can acquire different meanings depending on the field of application, context and communicative situation. In modern conditions of interdisciplinary interaction, the study of the variability of the translation of terms and commonly used vocabulary that functions in related areas, such as design, architecture, construction, fine arts and landscape design, is of particular importance. Each of these areas has its own terminological apparatus, which forms a specific semantic space. This leads to the appearance of homonym or polysemic units, which require a high level of professional competence and contextual sensitivity when translating.

1. Theoretical foundations of semantic variability and translation interpretation.

The problem of the ambiguity of terms is one of the key aspects of modern lexicology and translation studies. The scientific literature emphasizes that the meaning of a lexical unit is formed not only by intralinguistic factors, but also by extralinguistic ones, in particular, by the professional environment, direction of activity and functional needs of a certain field of knowledge. The processes of semantic specialization, metaphorization and secondary nomination are characteristic of terms of related fields.

When translating, it is also important to distinguish between the terminological and common meanings of a word. For example, the English word *model* in everyday context is translated as “model”, “sample”, in the field of 3D design – “three-dimensional model”, in construction – as “model”, and in fine arts it can mean “modeller”. In such cases, translation requires not only knowledge of the language, but also orientation in the relevant professional field.

2. The variability of translation in the field of design and architecture.

In the field of architecture and design, a large part of the terms is universal, but their interpretation often depends on the sub-industry. For example, the term *rendering* in architectural visualization means “rendering”, that is, the process of creating a photorealistic image. At the same time, in interior design it can be used to

refer to both the completed visual material (“visualization”) and a separate stage of project development. In construction, the same term can take on the meaning of “plaster” (the British version of *render*), which is significantly different from architectural usage.

A similar ambiguity is seen in the terms *section*, *elevation*, and *plan*. In technical drawing, *section* means “section,” *elevation* means “facade,” and *plan* means “plan.” However, in the visual arts, *elevation* can mean a decorative elevation or stylized image, and *section* occurs in the sense of “movement into a composition.” Thus, terms that seem unambiguous in a technical context may exhibit a wider semantic range in other areas.

3. Construction vocabulary: pragmatics and technological specificity.

Construction as an industry is characterized by a high level of standardization, which contributes to the accuracy of terminology. However, even here, one and the same lexical unit can have several interpretations. For example, *foundation* in the general sense is “base”, in construction engineering it is “foundation”, and in architectural theory it can denote the conceptual “base of a composition”. The term *joint* in construction means “seam” or “joint”, while in landscape design this term can denote the connection of individual sections of paving or a decorative seam between elements of masonry.

Such examples show that even within the same field, there are semantic fluctuations, and interdisciplinary translation requires taking technological processes into account.

4. Visual art vocabulary: semantic multi-layeredness.

In the visual arts, vocabulary is characterized by a high level of metaphoricity and a wide field of secondary meanings. The term *composition* in art means “the construction of a work of art”, while in landscape design it can denote the arrangement of plant and decorative elements on a site, and in architecture – the structure and interaction of individual volumes. The word *perspective* in art acts as

“linear perspective”, in design – as “point of view” or “angle of perception”, and in landscape design – as “visual depth of space”.

It is important that one artistic concept, when transferred across disciplines, can acquire a strictly technical meaning. For example, *texture* in art is “surface texture”, in digital 3D modeling it is “texture (material)”, and in construction it is “material structure” or “graininess of decoration”.

5. Landscape design as a field of intersection of architecture, ecology and art.

Landscape design combines technical, artistic and ecological principles, so the vocabulary of this field is mixed in origin and structure. For example, the word *form* can be translated as “shape”, “silhouette” or “outline”, while in botany it can mean “morphological type of plant”. The term *grading* in construction means leveling the site, and in landscape architecture – a whole complex of works on the formation of relief.

A separate group consists of terms borrowed from architecture: *axis*, *rhythm*, *module*, which in the landscaping acquire other shades of meaning related to natural factors and the aesthetic perception of space.

6. Problems of translating ambiguous vocabulary and ways to overcome them.

The main difficulties of translation are related to the following factors:

1. Contextual dependence of meaning. A term can change meaning depending on the design stage, technology, or genre.

2. The presence of cross-sectoral homonymy. The same word in different fields can have not only different, but also incompatible meanings.

3. Lack of established equivalents in the target language. In many cases, the translator is forced to choose between tracing, descriptive translation, or adaptation.

4. Ambiguity of terms of international origin. English-language terms are often used in several disciplines without a clear Ukrainian equivalent.

To solve these problems, it is advisable to:

• analyze narrowly specialized sources and standards;

• consult with specialists in relevant fields;

• create thematic glossaries;

• use corpus methods to identify the most frequent matches.

Conclusions.

The variability of the translation of the same lexical unit in different professional fields demonstrates the complexity and multidimensionality of semantic processes. Design, architecture, construction, fine arts and landscape design have common historical and terminological roots, but modern specialization has led to significant differences in the meaning of common terms. In such conditions, the translator must not only have linguistic knowledge, but also understand industry specifics, technological processes and artistic concepts. It is the interdisciplinary approach that ensures the adequacy of the translation and the accuracy of the transmission of professional information.

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THE WAYS TO SCAFFOLD STUDYING ENGLISH MEDICAL TERMINOLOGY FOR FIRST-YEAR UNIVERSITY STUDENTS

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Medical terminology contains specialized vocabulary which is used in Medicine for precise description of human body, its functions, conditions and diseases. It consists largely of words, word combinations, and abbreviations. Components and categories of medical terms are described in numerous medical language manuals, dictionaries, and other resources. Modern English medical terminology is the subject of multi-aspect research by scholars (Andrews, Luckhardt, 2012; Chabner, 2023 Ernstmeyer, Christman, 2024). These sources allowed us to familiarize with the contents and composition of English medical terminology, and to study how to choose

effective methods that could be used by the first-year medical university students who strive to master the basics to become confident users in English for Specific Purposes.

We defined the purpose of the research as an analysis of basic English medical terminology, aiming to define different groups of terms we study in English. We obtained the material for our work in the lists of the basic terminology encountered in our manuals for the subject English for Professional Purposes (Medicine).

We have researched the literature on English medical terminology and confirmed that Latin and Greek built the foundation for the modern English terminological system, which is currently formed on the basis of international medical terminology, which allows doctors from different countries to understand each other.

It should be stated that the glossary includes words, combinations of words, and abbreviations as well. The words that are composed of Greek and Latin combining parts of the words (suffixes, prefixes and roots) are involved in the formation of many clinical terms, and via Latin were borrowed into English medical terminology. For example, if we analyze the meaning of the compound word *pancreatitis*, we can identify the suffix -*itis* (inflammation), and the root *pancreato*- (pancreas) for the name of an organ, that together mean "*inflammation of pancreas*"; or the word *epigastric*: the prefix *epi*- (which means above above, on) + root *gastr*- (stomach) + suffix -*ic* (pertaining to), i. e., "*pertaining to above the stomach*". Another example could be the word *hypoglycemia* (*hypo*- – low, *glyc*- – glucose, sugar, sweet; -*emia* – blood condition): a condition of low blood sugar. If we analyze the word *hyperthyroidism* we can identify the prefix *hyper*- (above, over) + the root *thyroid*- (thyroid gland), + suffix "-*ism*" that means a process or condition: *"a condition of excessive functioning of the thyroid gland"*. It is easy to trace the similarity between the corresponding Ukrainian terms: *панкреатит, епігастральний, гіпоглікемія, гіпертироїдизм.*

Thus, international terms that mostly originated from Latin form the basis of medical language in English, as international anatomical, clinical, and pharmaceutical terminology happens to be common for various languages, in our case, in Ukrainian

and English. Many morphemes were adopted from Latin (e.g. *cardio-, pneuma-, intra-*, etc.), but many full Latin words also can be found (e.g. *diagnosis, symptom, hypoxia, hematoma, myelocyte, aorta*, etc.). Such words are universal and understandable for most languages, including Ukrainian (*діагноз, симптом, гіпоксія, гематома, мієлоцит, аорта*). This is why such practical analysis of medical terms helps in learning English medical words.

During the research, we also encountered many proper English names (or Old English), which can form the other group in English medical language.

Old English terms are more commonly used during communication with patients, as they are simple and compact, to name the main parts of the body or organs and simple processes or illnesses. For example, these are the following words in our material: *brain, heart, blood, liver, lung, skin, ache, bone, cough*, etc.

We grouped some words which are defined as eponyms: "the name of an object or activity that is also the name of the person who first produced the object or did the activity" (Cambridge dictionary online). Eponyms are capitalized and usually contain a noun in the possessive case ('s). For example, *islets of Langerhans, Loop of Henle, Foley catheter, Down syndrome, Alzheimer's disease.*

We also group the abbreviations, some of which are common in the area: *c/o (complains of), 1/7 (one day), 1/12 (one month), 1/52 (one week),* that are proper English. We found those called acronyms ("acronym – an abbreviation consisting of the first letters of each word in the name of something, pronounced as a word" (Cambridge Dictionary online): *CSF (cerebrospinal fluid), CNS (central nervous system), AIDS (Acquired Immune Deficiency Syndrome), RBC (red blood cells). WBC (white blood cells), BP (blood pressure).*

So we defined for the purposes of classifying the English medical terms at the initial stage (1st-year medical university course of English for Specific purposes) the following groups of medical terms: 1) complex words originated from ancient languages (Latin, Greek), which include the combining forms, e.g., otology, dermatopathy, arthrogenesis, hysterectomy, 2) words historically came from Old

English (e.g., bone, arm, head, finger, hand, wrist), 3) words composed of the word components (combining forms) both Latin/Greek and English word components, atrial, ultrasound, hepatic (e.g. dermic – derma-, meaning "skin" + suffix -ic for adjective: pertaining to skin); 4) eponyms (the islets of Langerhans); 5)abbreviations, including acronyms (CNS, BP, RBC, WBC).

During the study, we analyzed numerous medical terms in English that belong to different groups by origin, so we can conclude that it is very important to teach students how to understand loanwords and individual morphemes from Latin and Greek to facilitate the study of English professional medical terminology. Therefore, the parallel multilingual analysis (English, Latin/Greek, Ukrainian) into the educational process can help to understand and remember terms better. However, despite the fact that Latin and Greek borrowings make up the majority of the English medical vocabulary, many proper English terms cannot be studied using such analysis. Unique words are rare, and such list is short to be considered as remember it easy and fast.

Conclusions. Our analysis demonstrates the importance of applying parallel multilingual analysis (including English, Latin/Greek, Ukrainian) to the study as an effective method for learning foreign language for professional purposes. Practicing the described word analysis helped us to compile a list of universal words, so we can use without being misunderstood. Universal terminology is of practical importance for the international exchange of scientific information, research results, and ensuring the international mobility of specialists.

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NEUROLINGUISTIC PROGRAMMING

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Introduction

Neurolinguistic programming (NLP) is a linguistic discipline that combines psychology and language, which can help you reprogram your nervous system through the use of language. It was created by Richard Bandler and John Grinder in Santa Cruz Mountains in 1976 by studying counsellors renowned for their ability to communicate with influence, bringing significant change to their patients. Their first models were Fritz Perls – founder of gestalt therapy, Virginia Satir – family Therapist and Dr. Milton Erickson – hypnotherapist. They were successful on a consistent basis to enable their clients to heal and achieve the outcome of the sessions. Therefore, they were considered as geniuses and models of excellence by Grinder, Bandler and Pucelik. Three of them performed their techniques in therapy sessions on clients unconsciously. As a result, they were not consciously aware of what they were doing, which made them get results in therapy (The NLP Institute, n.d.).

NLP combines theories, models and techniques from a range of scientific and esoteric fields, to create accessible, understandable ‘tools’ which can be used by

individuals, teams and organizations and applied in a variety of contexts to improve outcomes, support wellbeing and create change (Definition of NLP). At its heart, Neurolinguistic programming is a modelling discipline and a technology, with a specific focus on the set of differences that make a variation between the performances of genius and average performer in the same field of activity. The objective of this modelling is to explicate in a way that is transferable and learnable, those set of differences. NLP works by observing how people think, communicate, and act, then modelling those patterns so they can be refined, taught, and applied by others. It requires more practice than theory (Definition of NLP, n.d.).

NLP coaches examine the language, beliefs, strategies, and behaviors of successful individuals and extract useful patterns that can be implemented in personal development or communication training. It makes this linguistics component highly adaptable, as it is not tied to a single fixed model but continually evolves as we discover new ways to work more effectively.

NLP also has six levels of change, purpose of each logical level is to organize and direct the information below it. As a result, making a change in a lower level may cause changes in a higher level. However, making a change in a higher level will also result in changes in the lower levels, according to its theory.

The six logical levels of change are:

1. Purpose and spirituality: This can be involvement in something larger than oneself, such as religion, ethics, or another system. This is the highest level of change.

2. Identity: Identity is the person you perceive yourself to be and includes your responsibilities and the roles you play in life.

3. Beliefs and values: These are your personal belief system and the issues that matter to you.

4. Capabilities and skills: These are your abilities and what you can do.

5. Behaviors: Behaviors are the specific actions you perform.

6. Environment: Your environment is your context or setting, including any other people around you. This is the lowest level of change (GoodTherapy, n.d.).

How knowledge about neurolinguistic programming can help us on a daily basis?

On a daily basis neurolinguistic programming helps you identify and shift the patterns of thought and behavior that may be holding you back, overcome stress and life challenges. By learning how to use language and mindset more effectively, you can create new outcomes, develop resilience, and unlock your full potential.

Proponents of NLP suggest that each person has a unique map of reality – a subjective model through which external events are interpreted. Expanding this internal map by incorporating diverse viewpoints allows the NLP user to gain deeper insight, improve communication, and respond more effectively to environmental demands. This method is based on experiential learning: if a person wants to understand an action, they must perform that same action to learn from the experience.

Conclusion

Neurolinguistic programming is an instrument that can give us another perspective of our lives and enrich our internal "map" of the world by transforming our patterns of perception and behavior, we begin to realize that there are alternative ways to achieve goals, acquire new skills, and navigate challenges. Although its scientific basis is debated, NLP can still serve as a practical tool for improving communication and exploring new ways of achieving personal goals. Ultimately, NLP opens the possibility that the world may offer far more opportunities than we once imagined.

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A SYMPHONY OF MIND AND SOUL: A JOURNEY INTO THE FUTURE

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When we think about the future, our imagination often paints us sterile, identical pictures of flying cars and shiny metal cities. But the real journey into tomorrow lies deeper than technological wonders. First and foremost, it is a pilgrimage to the very heart of humanity, which must find new forms of dialogue with its own creations, inventions and discoveries.

The future is not only a dimension of silicon and algorithms, programmed code and a lifeless 3D world, but also a space where science, culture and technology intertwine into a single living organism, woven from threads of logic, concepts of reality and fantasy. It is a thin canvas where every turn of the mind is nourished by a bright palette of emotions and feelings, and every technological achievement is understood through the prism of age-old cultural codes, traditions, and patterns.

Tomorrow's science will cease to be a strict outline of clear and separate disciplines. It will turn into a majestic symphony orchestra, where a biologist plays

in unison with a cyberneticist, and a physicist listens to the melody of a sociologist. The most significant discoveries will be born precisely at the border between these worlds, the thin thread between two opposite shores that have transformed into a single whole. Imagine, for example, an archaeologist who, instead of a brush, uses a quantum computer to model historical events in virtual space, literally recreating ancient civilisations with incredible accuracy. Or a doctor who treats not a specific disease, but the very concept of it, thereby 'reprogramming' cells with the help of nanorobots programmed to detect and neutralise pathogens before symptoms appear.

Neuroscience can open the door to the direct exchange of thoughts, where 'brain-computer' interfaces are a kind of analogue of telepathy, i.e., they will transmit not words but all the images and emotions of each individual. This could transform art into collective, 'common' creativity.

Perhaps biotechnology will transform cities into oases of life – vertical farms with special lighting will create the ideal microclimate for fruit that tastes like childhood and vegetables enriched with all the necessary vitamins. Agriculture will become a precise art, where every fruit grown results from harmony between genetics and ecology.

This is no longer science fiction, but a logical step forward in the evolution of knowledge, intellectual development, and scientific and technological progress. However, this powerful force will require a strong ethical core to preserve the distant and 'sensual' concept of 'us'. And here, culture comes to the fore, which has always been the soil, the basis, the foundation where our moral guidelines and standard ethical norms are rooted.

The culture of the future is our compass in this new, unknown and mysterious world. It will be able to reflect society and actively shape, change and transform it, becoming a bridge between people and technology. Art, literature, music – all of these will teach us compassion, empathy, critical thinking and what it means to be human in the age of artificial intelligence. We see how virtual galleries, accessible to anyone with an internet connection, preserve the masterpieces of cities destroyed by

war, recreating them in three-dimensional space with photometric accuracy. Imagine holographic figures of Shakespeare or Shevchenko reciting their works in your living room, bringing words to life in ways we could never have imagined. This is no longer about replacing real experience and worldview, but about its profound expansion, about erasing geographical and social barriers and obstacles to knowledge, progress and beauty. Perhaps culture will become that 'safe place' for our souls, which will not allow us to forget the warmth of the genuine, rather than the virtual and artificial; it will not allow us to forget the delicate sensation of the touch of a living hand, the smell of rain on trampled asphalt, or the silence of a real library filled with the rustling of pages.

But it is technology that will serve as the magical portal connecting scientific research with cultural expression. Let us hope it will not be the cold and soulless tool our human brain is accustomed to portraying it as. On the contrary, it needs to acquire the characteristics of art and become its extension. The programmer will be a poet of code, writing verses in Python, and the engineer will be a sculptor of a new material that combines the strength of steel with the lightness of a miniature, delicate web. Technology democratises access to knowledge and creativity. Imagine a blue-eyed boy from a small, remote village who, thanks to cheap VR glasses, will 'walk' through the streets of ancient Rome and then create his own symphony using the power of cloud computing, like a new Mozart of the digital age. Perhaps in such a world, AI will not be a competitor but a silent partner, an assistant who will take on the routine, freeing our minds for creative flight and our own ethical development. Perhaps it will help us translate the 'language of whales', decipher the handwriting of ancient civilisations, or find new medicines by modelling millions of molecules, revealing secrets buried in the depths of the ocean, time, or our own DNA.

However, this utopian picture also contains a loud warning. Senseless, uncritical enthusiasm for technology without a deep cultural and humanistic foundation and logical analysis is a direct path to a dystopia where humans become obedient appendages to machines, their voluntary slaves. What is frightening is that

the most dangerous challenge of the future may not even be the uprising of machines and robots, but our own spiritual stagnation, ethical decline, loss of humanity, emotional ‘brain’ and ability to marvel at the world outside the screen, in the ‘offline world’ (Ґіденс, 2004).

We must remember that any algorithm, any new technology, merely reflects its creators' worldview, values and, unfortunately, prejudices. That is why it is so important today to nurture not only technical talents, but also sensitive, educated, responsible and emotionally intelligent people who are capable of asking not only ‘How can this be done?’, but also ‘Why?’ and ‘At what cost?’.

Thus, our journey into the future is not a blind flight into the abyss of ‘technocracy’; it is a conscious, cautious path where every step forward in science is accompanied by a step deeper into our own “I”, into the world of culture and art, and not just glass skyscrapers and ‘OK, Google’. I hope that the path ahead of us is one where technology serves not to simplify life as much and as constantly as possible, but to make it deeper, richer, more conscious and more humane.

The future belongs not to those who can only build robots, but to those who can fill their existence with meaning, beauty, wisdom and compassion, nurtured by humanity not over a few years, but over thousands of years. And on this journey, our most faithful guide is not artificial intelligence, but the unbreakable, infinitely creative and knowledge-hungry power of the human spirit and strength, which has always been and remains our main competitive advantage and greatest secret.

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LE RÔLE DE L'ARGOT DES JEUNES DANS LA REPRÉSENTATION LINGUISTIQUE DU MONDE : UNE APPROCHE SOCIOLINGUISTIQUE

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L'argot des jeunes est l'un des aspects les plus dynamiques du vocabulaire de la langue contemporaine, reflétant les transformations sociales, culturelles et communicatives de la société. L'argot des jeunes est assez répandu parmi les jeunes, il permet d'établir un contact informel entre les interlocuteurs, il donne la possibilité d'exprimer ses intérêts, ses idéaux, ses besoins, c'est comme un langage quotidien de communication – c'est une sorte d'indicateur de leur niveau de développement, de leurs intérêts, de leurs besoins et de leurs goûts (Trimaille, 2011).

L'approche sociolinguistique permet de considérer ce phénomène non seulement comme une innovation linguistique, mais aussi comme un marqueur d'identité sociale, un moyen d'intégration de groupe et une façon de refléter la réalité contemporaine. Avant tout, l'argot des jeunes remplit une fonction d'identification (Auger, 2010). Les jeunes utilisent des unités linguistiques spécifiques pour désigner leur appartenance à un certain groupe, style de vie ou vision du monde. Grâce à l'argot, une frontière linguistique est créée entre "les nôtres" et "les étrangers". L'utilisation de mots tels que "краш", "зашквар", "крінж", "вайб", "чілити", "шиперити" ou "форсити" démontre non seulement la connaissance des formes lexicales à la mode, mais aussi l'appartenance à une certaine culture linguistique qui fonctionne dans un environnement numérique et mondialisé. Ainsi, la langue devient un outil d'autoprésentation et de recherche de soi.

Une autre fonction importante de l'argot des jeunes est sa fonction représentative, c'est-à-dire sa capacité à refléter la réalité à travers des catégories linguistiques propres à la vision du monde des jeunes. Les argots reflètent l'attitude des jeunes envers la vie quotidienne, les nouvelles technologies, les réseaux sociaux et la culture populaire. Par exemple, des mots tels que "тренд", "хайпити", "флексити", "ріл", "постити", "дізлайк" forment une nouvelle image du monde,

construite sur l'expérience de l'interaction numérique. La représentation linguistique du monde, caractéristique des jeunes, est basée sur l'émotivité, l'expressivité et la concision, ce qui correspond au rythme rapide de l'environnement communicatif moderne (Goudaillier, 2005). En sociolinguistique, l'argot des jeunes est également considéré comme un mécanisme d'adaptation aux changements sociaux. Les jeunes réagissent activement aux influences mondiales, notamment à l'anglais, qui est à l'origine d'une grande partie des argotismes contemporains. Les anglicismes pénètrent dans le langage des jeunes grâce à la musique, aux jeux vidéo, aux réseaux sociaux et aux médias (Myronova, 2025). Cependant, les jeunes ne se contentent pas d'emprunter des mots, ils les réinterprètent en leur donnant de nouvelles significations. Par exemple, le mot "краш" (en anglais – "crush") a acquis dans l'argot ukrainien une signification claire, à savoir "personne qui plaît", ce qui démontre la capacité de la langue à se réinventer avec souplesse. De tels processus confirment que l'argot des jeunes est un laboratoire d'innovations linguistiques.

La fonction d'intégration de groupe est tout aussi importante. L'argot rassemble les jeunes au sein de communautés liées par des intérêts communs : groupes de gamers, de musique, de création, de fans. Au sein de chacune d'elles se forment des microsystèmes de slang qui assurent une unité communicative interne. Parfois, la signification des mots n'est compréhensible que par les membres du groupe, ce qui renforce le sentiment d'appartenance et la compréhension mutuelle.

En examinant l'argot dans un contexte sociolinguistique, nous constatons qu'il remplit plusieurs fonctions : identification, expression, intégration, représentation, créativité. Les choix linguistiques spécifiques des jeunes donnent naissance à un système symbolique particulier qui permet de construire une communauté intra-groupe et de délimiter clairement les frontières entre les différents milieux sociaux. L'argot devient ainsi l'un des principaux outils d'auto-organisation sociale et d'autoidentification des jeunes. En même temps, l'argot des jeunes est un puissant mécanisme d'évolution linguistique. Il crée un espace pour l'expérimentation, la

réinterprétation des emprunts, de nouveaux modèles de formation des mots, ce qui, à terme, influence le système linguistique national (Mickūnaitytė, 2024).

En conclusion de cette étude, on peut affirmer que l'argot des jeunes est un phénomène sociolinguistique multiforme qui joue un rôle important dans la formation et le reflet de la vision linguistique du monde de la jeune génération. L'argot des jeunes est une sorte de marqueur linguistique du temps qui fixe les changements culturels clés, les tendances de l'ère numérique, les processus de mondialisation et la transformation des pratiques communicatives. De nombreux mots qui ont commencé comme des argotismes sont progressivement entrés dans l'usage courant et même dans les dictionnaires normatifs. Ce processus montre que le langage des jeunes n'est pas un phénomène marginal, mais au contraire une source productive de renouvellement de la langue en général. C'est pourquoi l'étude de l'argot des jeunes est importante non seulement pour la linguistique, mais aussi pour la sociologie, la culture et la psychologie, car elle permet de comprendre les valeurs, la sphère émotionnelle et le comportement linguistique de la génération actuelle.

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LES ORIGINES DES NOMS DE LIEUX FRANÇAIS : UNE CLASSIFICATION PAR CATÉGORIES SÉMANTIQUES

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Un toponyme, en tant qu'unité linguistique, désigne un élément géographique et fait partie intégrante du discours reflétant l'activité humaine. En effet, c'est le toponyme qui préserve les archaïsmes et les dialectismes, souvent issus des langues des peuples ayant habité un territoire donné par le passé.

Le rôle des toponymes ne se limite pas à identifier les éléments et phénomènes géographiques : ils remplissent diverses fonctions pragmatiques et sémantiques, reproduisant l'expérience, la culture et les traditions d'un peuple (Racine, 2017).

Lorsqu'ils examinent les aspects morphologiques, sémantiques et historiques de la création et du fonctionnement des toponymes, les chercheurs se heurtent à de nombreux problèmes et questions liés à leur étude. Parmi ceux-ci figurent l'origine des toponymes, leur orthographe, leur traduction, et bien d'autres.

Les sources de la formation des toponymes français peuvent être regroupées en différentes catégories sémantiques. Voici quelques exemples :

1) Toponymes descriptifs du paysage local : les formes caractéristiques du relief ont servi de base à la formation de nombreux toponymes : ***mont*** *(Clermont, Montmorillo, Beaumont) ;* ***vallée*** *(Laval, Valdivienne) ;* ***fons*** et son dérivé *fontana* – du latin – *source (Fontenay, Fondettes)* (Chareille, 2018).

2) Toponymes liés à la faune et à la flore : une caractéristique de la toponymie française est le choix des noms en fonction de la végétation dominante dans une zone donnée, des cultures agricoles, des champs, etc. Par exemple, le mot « forêt » a souvent servi de base aux noms de zones habitées en France : ***brogilo*** *(*du gaulois – *forêt) – Breil, Brille ;* ***lucus*** *(*du latin – *forêt sacrée) – Lucq, Luçon*.

Certains toponymes sont basés sur les noms d'arbres ou de plantes qui poussent dans une zone donnée : ***le buis*** *– Buissy, Buis-sur-Damville ;* ***le châtaignier***

– Châtenay-Malabry ; ***la fougeraie, la fougère*** *– Fougères, Feuges ;* ***le tilleul*** *– Tille, Tilloy-et-Bellay*) (Dubois, Mitterand, & Dauphin, 2021).

3) Toponymes motivés par l'activité humaine :

a) Toponymes basés sur des mots désignant des agglomérations : ***la ville*** *– Villeurbanne, Belleville, Villefontaine ;* ***villare*** (du latin *– colonie, village) – Villars, Villars-les-Dombes ;* ***mansus*** *(*du latin *– locaux séparés et dispersés) – Le Mas-d'Azil ;* ***borde*** est un mot d'origine germanique, signifiant *« ferme »* ou *« terre » – Bordeaux-Saint-Clair, Bourdeaux ;* ***Casa*** *(*du latin *– maison, habitation) – Cazes, Cassis.*

b) Toponymes dérivés de noms de métiers ou de bâtiments : deux bâtiments ont marqué la toponymie française : *la forge* et *le moulin*. *« La forge » et « fabrica »* (du latin *« forge »*) ont donné naissance à des toponymes comme ***Fabrègues*** et ***Fabrezan***. Le mot *« moulin »* est représenté par le toponyme ***Moulins***, ainsi que par des toponymes basés sur la métaphore du bruit du moulin : ***Bécheresse*** et ***Bécherel***. Parmi les noms de localités associés à des métiers, on trouve : ***l'Argentière*** (des mines d'argent), ***Sablet, Selonnet, Verrières-en-Forez*** (des verreries) et ***Savonnières*** (Tuaillon, 2022).

c) Noms dérivés de mots désignant des fortifications : le mot *« rocca »* (du latin *« rocher »*) était fréquemment employé pour nommer les châteaux construits sur un rocher *(Roquefort, Roche-la-Molière* ou *Roquevaire)* ; les mots *« château »* ou *« castellum »* (du latin *« château »*) se retrouvent dans des toponymes tels que *Châteaufort, Châteaurenard, Castellane* ; ***Castrum*** (du latin *« petite ville, village »*) *– Castres-Gironde* ; ***mur*** *(mur) – Mûrs-Erigné, Murs, Mures*.

d) Toponymes dérivés de mots à connotation religieuse, eux-mêmes issus de noms latins : ***cella*** (petit monastère) *– La Celle, Cellieu ;* ***ecclesia*** (église) *– Églisolles ;* ***cappella*** (chapelle) *– La Capelle, Capelle-lès-Hesdin*. Certains toponymes dérivent du mot *« Dieu » – Villedieu, Dieulouard, Dieuze.* Mais l'écrasante majorité des toponymes d'origine religieuse reposent sur des noms de saints. Les noms les plus couramment utilisés sont ***Saint-Martin*** *(Le Ban-Saint-*

Martin, La Capelle Saint-Martin, Saint-Martin-au-Bosc, Saint-Martin-Château, Saint-Martin-Choquel, Saint-Martin-Curton, etc.), ***Germain*** *(Saint-Germain-des-Prés, Saint-Germain-d'Esteuil, Saint-Germain-des-Vaux, Saint-Germain-de-Varreville, Saint-Germain-du-Bois, etc.),* ***Maurice*** *(Saint-Maurice-de-Gourdans, Saint-Maurice-de-Lestapel, Saint-Maurice-de-Rémens, Saint-Maurice-des-Champs,* etc.), etc. (Tuaillon, 2022).

e) Les noms de routes et d'itinéraires ont également marqué la toponymie de la France. Par exemple, ***Chassieu, Chaussan*** (du mot *chaussée*), **Carrouges** (du mot *carrefour*). Dans la toponymie française, les ponts sont représentés par le mot *« briva »* (d'origine gauloise) ou *« pons »* (d'origine latine). Il arrive que le mot latin remplace le gaulois : *« Briva Isarae »* devient *« Pontoise »*.

f) Certains toponymes français sont basés sur le nom de personnes ayant vécu dans la localité ou ayant joué un rôle important pour ses habitants : ***Amélie-les-Bains*** (en l'honneur de la reine Amélie, épouse de Louis-Philippe), ***Broglie*** (en l'honneur du duc de Broglie, seigneur de la ville), ***Decazeville*** (en l'honneur du duc de Decazes, ancien ministre de Louis XVIII) (Leclère, 2020).

g) Certains toponymes possèdent une connotation émotionnelle. Créés pour attirer l'attention sur la ville, ces noms ne reflètent pas toujours des événements réels. Les mots *« beau »* – ***Beaulieu, Beaumont, Beaune ;*** *« belle »* – ***Belleville*** – sont fréquemment utilisés pour former ces toponymes.

Les toponymes, bien plus que de simples étiquettes géographiques, constituent de véritables archives linguistiques et culturelles. Ils préservent les traces des langues anciennes, des dialectes et des peuples qui ont marqué un territoire, tout en reflétant les paysages, la faune, la flore et les activités humaines. Leur étude révèle une diversité sémantique et historique, allant des descriptions naturelles aux références religieuses, en passant par les métiers, les fortifications et les hommages à des personnalités. Ainsi, les toponymes français, par leur richesse et leur complexité, offrent une fenêtre ouverte sur l'histoire, la culture et l'identité des communautés qui les ont créés et transmis à travers les siècles. Leur analyse continue de poser des défis

passionnants aux chercheurs, tout en enrichissant notre compréhension du patrimoine linguistique et géographique.

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Sediakin O. A.

THEORETICAL AND METHODOLOGICAL ASPECTS OF TRANSLATION

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In the modern world, where intercultural communication is rapidly expanding, translation plays a crucial role as a bridge between languages, societies, and intellectual traditions. The theoretical and methodological aspects of translation studies form the scientific foundation that allows researchers and practitioners to understand the nature of translation, its internal mechanisms, and the strategies that ensure effective communication across linguistic and cultural boundaries. Translation is viewed not merely as a linguistic operation but as a complex process of transferring meaning, stylistic nuances, and pragmatic intentions from one language to another. Various theoretical models – linguistic, communicative, and

functionalist – provide different perspectives on how this transfer should be conducted and what principles guide the translator's choices.

Linguistic aspects remain central to translation studies, as they involve achieving equivalence and adequacy between the source and target texts. The translator must work carefully with lexical, grammatical, and syntactic structures, often applying transformations such as modulation, generalization, or transposition to preserve the logic and clarity of the text in the target language. However, translation is not limited to purely linguistic considerations. Pragmatic and cultural dimensions also play a significant role. The translator must take into account the communicative purpose of the text, adapting tone and style to meet the expectations of the target audience. Cultural references, idioms, and realia often require flexible strategies – ranging from direct borrowing to detailed explanations – to ensure that the reader fully understands the cultural background of the message.

The methodology of translation as a scientific discipline is inherently interdisciplinary, drawing on linguistics, psychology, cultural studies, and cognitive science. This interdisciplinarity allows scholars to analyze translation not only as a product but also as a mental and communicative process. A variety of research methods – such as comparative analysis, descriptive models, corpus studies, and experimental approaches – help uncover the patterns behind translators' decisions and provide insights for improving translation quality.

In practical terms, the work of a professional translator requires a clear and structured approach: preparatory reading, textual analysis, careful selection of translation strategies, drafting, editing, and final verification of the translated text. At the same time, modern translation practice increasingly relies on digital technologies. Tools such as translation memory systems, corpora, terminology databases, and machine translation broaden the translator's capabilities while demanding new technological and analytical competencies.

Today, translation studies face a number of challenges. Globalization leads to growing demand for accurate and culturally sensitive translations, while

technological progress – especially the rapid development of machine translation – requires specialists who can combine linguistic expertise with skills in post-editing and digital resource management. Furthermore, the increasing diversity of cultural contexts heightens the need for translators capable of navigating multicultural environments and adapting texts to the social and cultural norms of various audiences.

Thus, the theoretical and methodological aspects of translation provide a solid foundation for understanding and improving translation practice. A deep awareness of linguistic, pragmatic, and cultural factors enables translators to ensure high-quality communication between languages and cultures. The integration of innovative technologies and the ongoing development of methodological approaches will continue to strengthen translation as an essential field of human knowledge and professional activity in the globalized world.

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CONTRADICTIONS AND CRISES OF STUDENT AGE

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The main goal of reforming higher education in Ukraine is to ensure psychological and pedagogical conditions for the self-realization and self-development of the student as a subject of the educational process and subsequent successful professional activity.

Student age is characterized by crisis saturation. An age crisis is characterized by sharp and significant psychological shifts and personality changes; development acquires a turbulent, rapid character. Signs of a crisis can include the following:

- strong frustration, strong experiences of unsatisfied needs arise;
- exacerbation of role conflicts "student – teacher", "student – student";
- value-semantic uncertainty, unstructuredness of personality (for example, some learn about the possibility of self-government, self-regulation, and self-education for the first time);
- infantilism (the student behaves like an irresponsible person) or resorting to drunkenness, sexual promiscuity, drug use.

Each psychological age resolves its own contradiction. The crisis of 17-18 years is connected with the need for self-determination after finishing secondary school and searching for one’s place in the subsequent, already independent life. This is the construction of the next stage of one's own life path, the creation of one's "Self" for the future.

Young people rethink their lives, make certain adjustments, develop new strategies for the future, and not only "who to be?", "what to do?", but also "what to be like?". A young person lives rather in the future than in the present (orientation

toward the future). Naturally, life choices (like any choice) are accompanied by hesitation, doubts, self-doubt, experiences of uncertainty, and at the same time responsibility for every step toward the final decision making.

Simultaneously, self-determination also implies self-restriction. Why? Because every choice narrows life perspectives (for example, choice of profession). That is why young people feel fear of making a mistake. But within such hesitation and fear, professional orientation develops. In general, the outlook on the future among youth is optimistic. Young people choose a further life path, a profession, and become students.

But do all difficulties and problems of self-determination disappear for a young person who has already made their choice, chosen a future profession, and become a student? Unfortunately, no. For example, for the realization of a life plan in higher education, something might be lacking: communicative skills, knowledge and abilities to work independently, will and self-discipline, etc.

One of the reasons for this is the shortcomings of school education. Many students do not know how to take notes on lectures (this is not a dictation with an explanation of separate concepts – dictionaries exist for this) and primary sources, because they cannot perform semantic structuring of the text. They do not see theoretical provisions, but write down or rewrite only factual material.

In student years, a normative crisis is distinguished, which is overcome during the period of adaptation to studying at a HEI. However, this crisis may acquire a protracted character: difficulties are not resolved but put off for later due to reluctance to solve them. For instance, negative feelings may arise from the necessity to attend classes, a critical attitude toward teachers, conflicts with comrades.

The most critical situations of student age are as follows:

1. Crisis of professional choice. This crisis is caused by the fact that the choice of profession often occurs after admission to higher school. Due to this, dissonance often arises between the unconsciously chosen profession and the necessity of obtaining higher education, even if in a different specialty. The ambivalence of such

tendencies (either to leave the HEI by one's own conscious choice or to continue studying to preserve socio-cultural status) often leads to the development of many personal problems and psychosomatic disorders in students.

The fact of admission to the university generates hope for a full and interesting life, strengthens the young person's faith in their own powers and abilities. However, disappointment quickly sets in for some: the question arises about the correctness of the choice of the HEI, profession, specialty. At the end of the 3rd year, the issue of professional self-determination is generally resolved, yet far from all graduates connect their professional future with the specialty obtained at the HEI. The problem of career guidance and professional selection arises acutely.

2. Crisis of dependence on the parental family. On the one hand, young people may live separately from the parental family in a student dormitory, have a pronounced tendency toward independence, show personal maturity, but on the other hand – emotional-personal and domestic (especially material) dependence on parents.

3. Crisis of intimate-sexual relations. Student age corresponds to the period of strengthening sexual drive. The need for intimate-personal relations with a psychologically and spiritually close person (friend, beloved) grows. At the same time, the creation of one's own family is blocked by material dependence on parents, housing unsettledness (this is more acutely expressed in students than in their peers working in production), and extramarital relations are generally socially disapproved and may be accompanied by internal personal conflict (tension). In some students, intimate relations may overshadow everything else.

4. Crisis situations in educational-professional activity. Factors provoking crisis situations in students include certain psychotraumatic features of the organization of the educational process in higher school. Often the study and successful "passing" of some academic discipline becomes an end in itself, rather than a means to achieve the goal of mastering professional knowledge and skills necessary for future work. Unfortunately, these tendencies are supported not only by

personally immature students but also by individual teachers. Creative and conscious mastery of knowledge is displaced by cramming educational material and conformity regarding the examiner. The existing analogy between an exam and a lottery aggravates the situation. Unsystematic (pre-examination) study of material not only does not contribute to the formation of deep professionally important and personally significant knowledge and skills but also provokes psycho-emotional overloads.

Recently, cases are not isolated where some teachers "discharge" their personal problems and conflicted relations, which were blocked, by way of "examination executions" of students. Moreover, one of the grossest pedagogical mistakes is allowed: the teacher transfers the negative assessment of the results of mastering the curriculum to the assessment of the student's personality in general, evaluating him as unintelligent, lazy, irresponsible, etc. This can negatively affect the well-being of students, lead to deterioration of their health status, and the necessity to take academic leave because of this.

A crisis can also arise in senior years. The main problem is building plans for the future, however, everything is considered from maximalist positions: everything must be the best, unique, unrepeatable (all or nothing).

Often, the situation of employment after graduating from a higher educational institution is also a crisis. Thus, in current conditions, many graduates who mastered pedagogical specialties are not oriented toward professional-pedagogical activity. This profession is not a personally significant life value for them, and therefore they do not connect their future with it. This serious problem is further aggravated in conditions of economic hardship, the absence of a stable labor market, and the decline of the social prestige of a teacher's labor. The inner life of a student is also saturated, rich in experiences, filled with contradictions: friendship – loneliness; criticality – self-criticism; shyness – boasting; selflessness – selfishness, etc.

Among the contradictions of student age, the crisis of identity connected with the "Self" system plays an especially important role. Identity is a stable image of "Self," preservation and support of one's personal integrity, sameness, continuity of

one's life history and one's own "Self". The essence of the identity crisis: a collision of values internalized in early youth occurs with those forming during study in higher school through identification of oneself with a professional model. The whole complexity lies in the fact that a person in this period is ambivalent; for example, contradictory feelings may arise even regarding the same person.

What helps to overcome the identity crisis? Awareness of changes occurring within oneself: self-analysis, self-criticism, self-esteem, that is, strengthening of reflection. The subject himself must become an object of observation, analyze his mental state. Trusting relationships with those (friend, teacher, etc.) who are an authority to whom one can confess. One's own constructive position, ability to set a goal, make a decision, and execute it. Sometimes it is worth reviewing the system of one's values, rebuilding their hierarchy, accepting new values. But a constructive decision regarding one's further life or a decision regarding life problems must be made by the person himself, and he must be responsible for it.

It is also important to be able to manage one's emotional state (autogenic training, "driving" stress into muscles, increasing time for sleep, "I will think about this tomorrow..."); look for positive moments in failures (one can always find them!); share with a close person (advice!).

If a student fails to solve these tasks, an inadequate identity is formed in him, the development of which may proceed in the following main directions:

- withdrawal from psychological intimacy, avoidance of close interpersonal relationships;
- blurriness of the sense of time, inability to build life plans, fear of growing up and change;
- washing away of productive, creative abilities, inability to mobilize one's internal resources and concentrate on some main activity;
- formation of a "negative identity," refusal of self-determination, and choice of negative models for imitation.

The contradiction between "Real-Self" and "Ideal-Self" of a student can lead to internal self-doubt ("inferiority complex") and be accompanied by external aggressiveness, sloppiness, promiscuity, or a feeling that those around do not understand you.

The consequences of a negative "Self-concept" of students can be the following manifestations: withdrawal into oneself, "closing off" from others; demonstration of a "mask", a "false face" to others ("Self" which is presented to others rather as "Ideal-Self" and contradicts "Real-Self"); excessively sensitive reaction to criticism, laughter, and condemnation; painful experience of failures in study (work) and revealed own flaws (in particular, under the influence of studying psychology); excessive shyness, lack of sociability, tendency toward mental isolation, departure (moreover, not always voluntary) from reality into a world of dreams. The lower the level of self-respect, the more likely the student suffers from loneliness.

But every crisis has positive sides: only in this period – the period of crisis – does the environmental factor produce an "all or nothing" effect! Such an environment for a student is the higher educational institution – a factor of socialization. A crisis is an aggravation of contradictions, and contradiction is the driving force of development: a person pushes away from unconscious dependence, acquires selfhood. This makes it possible to know oneself better, which is the basis and condition for the further development of the "Self".

Thus, awareness of changes occurring within oneself, strengthening of reflection helps to overcome the identity crisis. Students must have their own defining view, their own opinion, their own assessments, views on various life collisions, their own attitude, and their own choice of life direction. However, the flourishing of intellectual and physical forces and external attractiveness in some students creates an illusion of the ease of achieving any goals – unconsidered nihilism, categoricalness of assessments, and distrust of elders and adults arise.

Consequently, knowledge of the features of student age allows one to understand the essence of one's personality and timely define oneself and one's life path.

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HUMANITIES IN THE MODERN WORLD: VALUE AND PERSPECTIVES

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The humanities are a family of disciplines that investigate meaning, values, and symbols in human life. They study texts, images, performances, and material traces to understand how people make sense of the world and organize collective life. In contrast to purely nomothetic fields, the humanities rely on interpretation and contextualization, connecting evidence to cultural frameworks and lived experiences.

The classical core – philosophy, history, philology, literary studies, linguistics, art history, cultural studies – is complemented today by newer, areas such as media studies, memory studies, and heritage science. The unifying principle is attention to language, form, and interpretation, and the idea that knowledge about culture is plural and historically situated (Bourdieu, 1993).

Social roles of the humanities are commonly grouped into four functions. First, the epistemic function: they enlarge the archive of human experience, curate collective memory, and make complex social worlds intelligible. Second, the ethical function: they cultivate judgment, empathy, and civic imagination, which democratic institutions require. Third, the communicative function: humanities train clear,

argumentative writing and cross-cultural literacy. Fourth, the critical function: they disclose hidden assumptions and power relations, opening possibilities for responsible change.

Methodologically, the humanities combine close reading of sources with comparative analysis. Hermeneutics, rhetoric, and semiotics provide tools for thick description; the historical method frames sources in time; and criticism evaluates arguments and aesthetic forms. During the last two decades, these tools have been extended by computational methods under the umbrella of the digital humanities: corpus linguistics, stylometry, computer vision, network analysis, and geospatial mapping (David M. Berry, 2012).

Digital humanities do not replace interpretation; they produce new evidence and visualizations that are then interpreted. For instance, topic models and word embeddings help identify latent themes in large text corpora, while network analysis reveals structures of influence in literary movements or correspondence networks. Geographical information systems (GIS) permit reconstruction of historical urban spaces and mobility patterns. However, each computational step must be transparent and reproducible; otherwise, results risk gaining false authority merely because they are quantified (Drucker, 2014).

A particularly promising field is the preservation of cultural heritage. Digitization of archives and museum collections creates resilient copies, widens access, and enables new kinds of scholarship. For regions affected by war and migration, digital surrogates document loss and support restitution claims. Crowdsourcing platforms invite citizens to annotate images and transcribe manuscripts, building bridges between expert knowledge and public engagement.

Humanities also contribute to science and technology by mediating values in design. Ethnographic and historical insight helps anticipate how technologies will be embedded in social life. Narrative analysis is used in participatory design to articulate user stories and boundary cases. Ethical frameworks developed in philosophy – duty, utility, and virtue – guide responsible innovation, while cultural studies warns against

the exclusion of vulnerable groups. In this sense, humanities are not just about the past; they provide languages for negotiating futures.

The education dimension is crucial. Employers consistently value skills that the humanities develop: analytical reading, structured writing, argumentation, teamwork, and intercultural competence. Graduates work in journalism, creative industries, education, public service, NGOs, and tech companies. The narrative that 'humanities are impractical' confuses immediate vocational training with long-term adaptability. In fast-changing economies, the ability to learn new domains and to translate between expert communities is a durable advantage.

At the same time, the humanities face genuine challenges. Shrinking public funding and over-reliance on short-term metrics create pressures to instrumentalize research. Digital platforms transform reading and attention, while misinformation and algorithmic curation reshape public spheres. Addressing these problems requires open access policies, data literacy, collaboration with libraries and memory institutions, and renewed public humanities that work with communities rather than speaking for them.

For Ukraine, the humanities have both protective and transformative tasks. They document war crimes and cultural losses; preserve languages and local histories; counter disinformation through source criticism; and help design inclusive policies for reconstruction. International cooperation in archives, translation projects, and digital preservation will contribute to European integration and cultural resilience.

In conclusion, the humanities remain indispensable for societies that aspire to freedom, dignity, and democratic vitality. By defending plurality, contextualizing facts, and cultivating judgment, they equip individuals with the critical capacities necessary to question assumptions, resist simplification, and engage responsibly with complexity. Through practices of interpretation, debate, and ethical reflection, the humanities foster empathy and self-awareness, enabling citizens to understand

perspectives different from their own and to recognize the moral dimensions of social and political life.

The digital turn has undeniably transformed the methods and reach of the humanities, expanding access to sources, audiences, and analytical tools. Yet it does not replace interpretation or human responsibility; on the contrary, it reinforces the need for careful reading, rigorous citation, and transparent knowledge-sharing. In an era marked by information overload, misinformation, and algorithmic influence, the humanities play a crucial role in teaching discernment and intellectual integrity, ensuring that technological progress is accompanied by critical awareness rather than passive consumption.

Beyond the production of knowledge, the humanities also contribute fundamentally to social cohesion. By preserving collective memory, transmitting cultural heritage, and encouraging dialogue across cultures and generations, they help societies understand where they come from and imagine where they might go. They create spaces for conversation rather than polarization and for understanding rather than exclusion. In a rapidly changing world shaped by moral uncertainty, cultural diversity, and technological acceleration, the humanities provide essential conceptual frameworks to navigate these challenges thoughtfully, ensuring that progress remains guided by human values, ethical responsibility, and a deep respect for diversity.

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AUTOMATIC DETECTION OF ONLINE MISINFORMATION USING LINGUISTIC FEATURES

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The digital information ecosystem has transformed how people access, share, and interpret news. While this shift has democratized communication, it has also enabled the rapid dissemination of misinformation, ranging from misleading headlines to fully fabricated narratives. Traditional fact-checking approaches, though essential, are too slow to address the scale of online content (Graves, 2018). As a result, researchers increasingly turn to computational methods that analyze linguistic features to detect deceptive or harmful text automatically.

Linguistic cues, patterns in vocabulary, syntax, sentiment, and discourse, often reveal subtle differences between truthful and deceptive writing (Feng, 2012). These cues, when combined with machine-learning models, can help identify suspicious content before it spreads widely. This article explores how linguistic features contribute to misinformation detection and how computational systems leverage these signals to enhance online safety.

Misinformation frequently relies on emotionally charged language to provoke strong reactions. Research shows that false or manipulative content often contains exaggerated sentiment, heightened fear appeals, or moral outrage. Automated sentiment analysis can detect unusually intense emotional patterns, flagging content that deviates from typical news reporting norms.

Deceptive texts sometimes exhibit distinctive syntactic structures. For example, misinformation may use simpler sentence constructions, excessive passive voice, or ambiguous phrasing to obscure responsibility or create vagueness (Hancock, 2008). Parsing tools can identify these patterns, helping models distinguish between credible reporting and suspicious narratives.

The organization of ideas within a text can also signal deception. Misinformation often relies on abrupt topic shifts, unsupported claims, or rhetorical

markers such as “they don’t want you to know,” which attempt to create artificial authority (Rubin, 2015). Discourse analysis enables systems to detect these irregularities in coherence and argumentation.

Every writer or content source has a stylistic fingerprint, patterns in punctuation, word choice, and rhythm. Misinformation networks often reuse templates or stylistic patterns across multiple posts. Stylometric analysis can identify these recurring signatures, linking suspicious content to known misinformation sources.

Supervised machine-learning models can be trained on labeled datasets of real and fake news to learn linguistic patterns associated with deception. Features such as n-grams, part-of-speech tags, and sentiment scores serve as inputs for classifiers like logistic regression, random forests, or support vector machines (Rashkin, 2017).

Neural models, including LSTMs and transformers, capture deeper semantic and contextual relationships within text. These models can detect subtle linguistic cues that traditional feature-based methods may overlook, making them particularly effective for complex misinformation scenarios.

The most robust detection systems combine linguistic features with metadata, such as source credibility, user behavior, or network propagation patterns. This hybrid approach improves accuracy by integrating both textual and contextual signals (Shu, 2017).

Despite significant progress, linguistic-based misinformation detection faces several challenges. Deceptive writers can adapt their style to evade detection, and emotionally charged but truthful content may be misclassified as suspicious. Cultural and linguistic diversity also complicate model generalization across languages and communities. Additionally, automated systems must balance accuracy with ethical considerations, avoiding censorship or bias.

Linguistic features offer powerful insights into the structure and intent of online content, making them valuable tools for detecting misinformation. By analyzing sentiment, syntax, discourse markers, and stylistic patterns, computational

models can identify deceptive text with increasing precision. However, linguistic cues alone are not sufficient; effective detection requires hybrid systems that integrate textual analysis with contextual data. As misinformation continues to evolve, interdisciplinary collaboration between linguists, computer scientists, and cybersecurity experts will be essential to developing reliable and ethical detection technologies.

We explored how linguistic cues can support the automatic detection of online misinformation. It explains how sentiment, syntax, discourse markers, and stylistic fingerprints reveal patterns associated with deceptive writing. It also outlines computational approaches, ranging from machine-learning classifiers to deep neural networks, that use these features to identify fake or harmful content. While linguistic analysis provides valuable insights, the article emphasizes the need for hybrid systems and careful ethical considerations. Ultimately, linguistic-based detection represents a promising but evolving strategy for addressing misinformation in the digital age.

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PROBLÈMES DE LA RECHERCHE DISCURSIVE DANS LE PARADIGME LINGUISTIQUE MODERNE

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Depuis l'aube de l'humanité, la question du discours a toujours intéressé ses représentants, et l'apparition de l'écriture a permis sa transmission aux générations futures. Ainsi, les chercheurs ont constaté que, dès l'Antiquité, les philosophes pionniers se sont penchés sur les notions de communication, de pathos et de sophisme, contribuant ainsi à l'élaboration de cette question sous l'influence de divers facteurs.

De manière générale, le discours et l'action sont deux composantes de l'échange social qui jouissent d'une autonomie propre. C'est de leur combinaison que naît le sens de l'échange linguistique. Comme on le sait, le concept de « discours » existe depuis l'Antiquité. On trouve des mentions du concept de « logos », très proche par essence de celui de « discours », chez Platon. Jacques Derrida l'a illustré de façon très éloquente dans son ouvrage « La Pharmacie de Platon ». René Descartes a analysé ce discours dans son célèbre ouvrage « Discours de la méthode » et a déclaré : « Si ce discours paraît trop long pour être lu d'une traite, on peut le diviser en six parties. » (Descartes R. 1902), le discours étant ici employé comme processus de pensée ou comme moyen de narration, c'est-à-dire comme présentation d'informations.

Mikhaïl Bakhtine a apporté une contribution majeure au développement de la notion de discours dans ses ouvrages « Les problèmes de la créativité de Dostoïevski » et « François Rabelais dans l'histoire du réalisme ». Le principe de polyphonie et d'intertextualité s'est avéré très utile pour l'analyse des romans de Rabelais et d'autres auteurs. Le romantisme étant un mouvement multilingue, son influence ne se limitait pas aux romans français, mais s'étendait à une grande partie du patrimoine littéraire mondial.

Yürgen Habermas estimait que le concept de « discours » se manifeste dans le cadre de la communication entre un patient et le médecin qui le soigne. Dans son ouvrage « Théorie de l'action communicative », il écrit que *« la réalisation d'une compréhension entre les participants au discours est également possible grâce à leur capacité à réfléchir sur les exigences de la signification de leurs propres actes de langage »*, ce qui souligne l'importance fondamentale du concept communicatif, ou « discours » (Dmytrenko 2018).

Desanti avait déjà abordé directement la question du discours dans l'œuvre de Bakhtine : d'un point de vue structuraliste, seul le « discours » devrait retenir l'attention des chercheurs. Selon D. Desanti, c'est exactement ce que fait le « formaliste Bakhtine » : *« C'est dans le discours, dans la « poétique » que Bakhtine fouille »* (Desanti, 1970).

Un point de vue alternatif, mais essentiel, est celui de Patrick Charaudeau, qui écrit : *« L'analyse du discours, en France, s'est développée, on le sait, sur un corpus spécifiquement politique. Des notions nouvelles comme celles d'« énonciation », de « corpus de textes » (et non plus seulement de phrases), de « contextes », de « conditions de production » ont permis aux études linguistiques de découvrir et de déterminer un nouveau champ d'analyse du langage qui ne renvoyait plus à la langue, à l'étude des systèmes de la langue, mais au discours, c'est-à-dire aux discours qui circulent dans le monde social… »* (Charaudeau, 2010).

La France est largement reconnue comme l'un des pays les plus actifs en matière de discours politique et social. Pays multinational, elle est constamment au

cœur des débats sur les questions de migration, de laïcité, de retraite et de politique environnementale, voire sur sa sortie de l'UE, à l'instar du Royaume-Uni. L'éloquence, partie intégrante du discours, joue un rôle important dans la diffusion des idées et la propagande. L'analyse du discours politique (et, par conséquent, du discours social) est donc un sujet d'actualité non seulement pour les Français, mais aussi pour le monde entier. Il apparaît donc clairement que l'Ukraine, même si elle n'est pas reconnue comme un chef de file mondial du débat, doit néanmoins étudier et intégrer de telles pratiques à ses outils politiques. Cela vaut non seulement pour la loi martiale et les agressions militaires non provoquées, mais aussi pour son éventuelle adhésion à l'UE, qui est à la fois son droit et son devoir.

Ceci démontre que, malgré le développement technologique des années 1980 et 1990, une discipline comme l'analyse du discours conserve toute son importance.

De manière générale, la parole établit un lien entre un discours et une situation donnée ; il n'est donc pas surprenant que cette question ait suscité l'intérêt depuis l'Antiquité. De nombreux penseurs de renom, tels que Bakhtine, Foucault, Saussure, Jakobson et bien d'autres, s'y sont intéressés. Un travail considérable a été mené dans ce domaine, et nombre de thèses, formulées il y a plusieurs décennies, restent pertinentes aujourd'hui ou font l'objet de recherches actives. Nous avons abordé l'importance de l'étude du discours dans les romans, de l'analyse littéraire au débat politique, car tous ces éléments constituent des outils d'influence sur la conscience humaine et, de ce fait, une composante essentielle de notre existence.

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THE ESSENCE OF NOTICING SKILLS IN VOCABULARY ACQUISITION WHILE LISTENING

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Listening allows learners to acquire new lexical units when being exposed to authentic English audio materials, films, music videos, etc. However, for the vocabulary acquisition to be successful, learners need to develop noticing skills.

It is known that the concept of noticing skills is based on the Noticing Hypothesis, proposed by linguist Richard Schmidt (Schmidt, 2010). Over the past two decades, researchers in the field of foreign language teaching have become increasingly interested in the concepts of attention and awareness. The approach proposed by Richard Schmidt is founded on these concepts (Al-Hejin, 2005). The Noticing Hypothesis states that language learners must consciously notice specific linguistic forms in the text they hear in order to effectively learn them. This theory suggests that attention to linguistic features plays a crucial role in learning a foreign language, making it important for learners to be aware of the differences in grammar,

vocabulary, and pronunciation. We believe that noticing involves several cognitive processes. Therefore, the aim of the study is to define the essence of noticing skills in vocabulary acquisition while listening. To achieve the aim, we need to explore the process of listening as a cognitive activity.

Listening as a cognitive process was considered by Anderson (Anderson, 2010). According to the structure he proposed, listening consists of three phases: perception, parsing and utilization. Decoding takes place during the perception stage, where initial recognition of the input occurs. The parsing phase then involves processing meaning by utilizing lexico-syntactic knowledge, such as grammar and vocabulary, to convert the input into a mental representation of the message. During the utilization phase, listeners might enhance this mental representation with additional cues for a deeper understanding, react to the message, or retain the information for future use. Anderson's model emphasizes the cognitive processes underlying listening, proposing that language instruction should prioritize developing attention, expanding vocabulary, and strengthening background knowledge to improve listening comprehension.

In our opinion, noticing of new vocabulary occurs during listening through the following cognitive processes (Fig. 1). By understanding the sequence of cognitive processes involved in listening comprehension, the teacher becomes better prepared to develop students' noticing skills for the acquisition to take place.

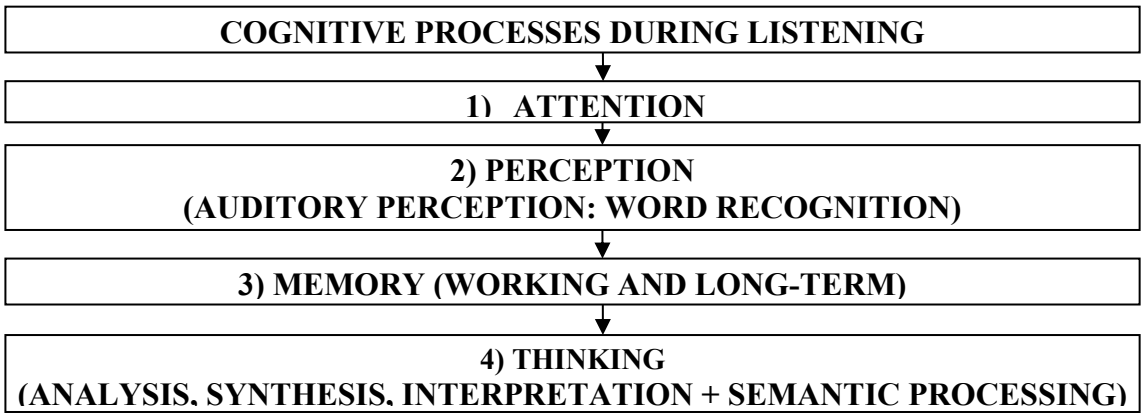

Fig. 1 Logical-structural sequence of cognitive processes in listening comprehension

According to the theory of speech activity, the listening process has a three-level structure, which includes the motivational, analytical-synthetic, and executive levels (Mendelsohn, 2008). The motivational level depends on the activity of the listener. Listening itself is not the ultimate goal of communication, but acts as a way to obtain the necessary information. The next level is the analytical-synthetic one, at which the perception and decoding of the received information is carried out. This level consists of several stages, such as semantic prediction, verbal comparison, establishment of semantic connections, and formulation of meaning. The analysis and synthesis of all speech units (in particular, sounds, words, word combinations, sentences, etc.) is the process of understanding. Therefore, listening comprehension can be defined as the process of identifying connections and relationships conveyed in sound form. It also includes the ability to relate the sound form of a speaker's utterance to the meaning of individual lexical items or the utterance as a whole. Consequently, perception is a complex process that involves the interaction of all mechanisms, namely working and long-term memory, as well as the processes of probabilistic prediction and analysis. Memory and comprehension are key elements of this process, because in order to make any prediction, it is necessary to first receive information, remember it and then analyze it.

Thus, we propose to define the skills of noticing new lexical units while listening as the ability to successfully notice, recognize by ear, and retain new lexical units in memory; to understand or guess their meaning; to compare the features of a new lexical unit with information already known (the ability to reflect).

In conclusion, the development of noticing skills for new vocabulary acquisition plays an important role in teaching listening because listening is a key tool for mastering new vocabulary and consolidating already known lexical items through a certain logical sequence of cognitive processes.

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MOTIVATION IN LANGUAGE LEARING

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Motivation has long been regarded as one of the decisive factorsinfluencing success in second language learning. Although cognitive ability, instructional quality, and contextual variables all play significant roles, motivation determines the learner's willingness to initiate, sustain, and complete the long and demanding process of acquiring a new language. As Richards and Rodgers (2014) emphasize, even the most carefully designed teaching methodology cannot succeed if learners do not possess a motivational drive. Language learning requires sustained effort and perseverance, and motivation is the psychological force that supports this endurance.

Over time, the concept of motivation in language learning has undergone significant theoretical development. Early behaviorist models viewed learners as responders to external stimuli, with motivation seen primarily as a matter of reinforcement and conditioning. Learners were believed to be driven by rewards,

punishments, and habit formation, and instructional methods such as the Audiolingual Approach relied heavily on these assumptions.

However, scholars like Harmer (2015) note that behaviorism provides little insight into learners' inner drives, emotions, and long-term engagement. As the field shifted toward cognitive and humanistic perspectives in the 1970s and 1980s, motivation began to be understood as originating from internal mental processes. Learners were redefined as active agents who set goals, evaluate their own progress, and regulate their behavior. Brown and Lee (2018) highlight how beliefs about competence, expectations for success, and perceived relevance contribute to motivational strength. Humanistic approaches further emphasized emotional well-being, personal growth, and autonomy. Larsen-Freeman and Anderson (2016) describe how approaches such as Community Language Learning sought to cultivate intrinsic motivation by prioritizing empathy, safety, and learner-centeredness. Intrinsic motivation – engaging in learning for personal satisfaction or interest – became recognized as particularly valuable for sustained achievement, while extrinsic motivation – engaging for external rewards – was seen as useful but less stable.

Contemporary research has built on these foundations. Dörnyei's L2 Motivational Self System (2020) has become especially influential, arguing that language learning is driven by learners' visions of their future selves. According to this model, the Ideal L2 Self – a mental image of oneself as a competent second-language speaker – is a powerful motivator that inspires effort and persistence. In contrast, the Ought-to L2 Self represents external expectations, such as academic requirements or career demands. The third component, the L2 Learning Experience, encompasses situational factors related to the classroom environment, teacher support, and immediate learning conditions. Together, these components highlight that motivation is not only intrapersonal but also shaped by contextual and social factors. More recently, sociocultural and dynamic systems perspectives have emphasized that motivation is fluid and constantly evolving. Lightbown and

Spada (2021) point out that learners' motivation fluctuates from moment to moment depending on task demands, emotions, peer interactions, and life circumstances. Larsen-Freeman (2016) argues that language learning itself is nonlinear and complex, and motivational processes mirror this complexity. As a result, motivation is no longer seen as a stable trait but as an adaptive process that teachers must continually support.

Within this broad theoretical landscape, researchers distinguish between different types of motivation that influence language learning. A central distinction is between intrinsic and extrinsic motivation. Intrinsic motivation derives from curiosity, enjoyment, or personal interest in the language. Extrinsic motivation relies on rewards such as praise, grades, or future opportunities. Harmer (2015) maintains that although extrinsic forces may initiate learning, intrinsic motivation is crucial for long-term persistence. Another important distinction is integrative versus instrumental motivation. Integrative motivation involves a desire to connect with the target language community or culture, whereas instrumental motivation focuses on practical goals such as employment or academic achievement. Richards and Rodgers (2014) observe that modern learners often display a blend of both orientations. Achievement motivation and self-efficacy also play a vital role. Learners with strong self-belief are more likely to attempt difficult tasks and adopt effective learning strategies. Brown and Lee (2018) highlight that teachers can support self-efficacy by providing scaffolded tasks, opportunities for success, and constructive feedback. Task-specific motivation constitutes another key element. Certain tasks stimulate more engagement, especially when they are meaningful, cognitively challenging, and tied to authentic communication. Thornbury (2017) notes that even grammar learning – often considered less inherently motivating – can be engaging when tasks are interactive and purposeful.

Teachers thus occupy a central role in shaping learners' motivational experiences. Their personality, enthusiasm, empathy, and classroom management significantly influence learners' willingness to participate. Harmer (2015)

emphasizes that positive teacher-student rapport fosters emotional safety, reduces anxiety, and enhances intrinsic motivation. Brown and Lee (2018) argue that motivation is deeply connected to the overall emotional climate within the classroom. Motivational teaching practices include setting clear goals, offering meaningful and timely feedback, incorporating student choice, integrating culturally relevant materials, and using cooperative learning structures. Nation and Macalister (2020) explain that curricula must be designed with motivation in mind by including authentic content, varied tasks, and opportunities for learner autonomy. Larsen-Freeman and Anderson (2016) note that meaningful communication enhances engagement, while iterative feedback and clear expectations help sustain long-term effort. Dörnyei (2020) suggests additional techniques such as imagery training, reframing tasks to emphasize personal relevance, and maintaining curiosity by gradually increasing task complexity. The social dimension of motivation is equally important. Group dynamics can either strengthen or weaken learners' engagement. Supportive peer relationships promote risk-taking, while competitive or negative environments undermine confidence. Brown and Lee (2018) highlight that motivation often spreads through groups, making the cultivation of positive learning communities a key pedagogical responsibility.

Curriculum designers also play a role in supporting motivation. Nation and Macalister (2020) argue that motivation should be integrated from the earliest stages of curriculum development. A motivating curriculum includes clear learning outcomes, task variety, meaningful content, and opportunities for personalization. Authenticity is crucial: learners respond positively when materials reflect real-world communication needs and connect with their personal interests. Harmer (2015) stresses that relevance enhances engagement and transforms language learning from a school requirement into a personally meaningful pursuit. Assessment practices must also support motivation. Brown and Lee (2018) advocate for formative assessments that highlight progress, encourage reflection,

and promote self-regulation. Excessive emphasis on grades can undermine motivation, while constructive, growth-oriented feedback strengthens it.

Grammar instruction presents a special challenge for motivation, as it is often perceived as abstract or tedious. Thornbury (2017) argues that grammar can become motivating when taught through discovery, interaction, and meaningful communication. When learners understand how grammar supports their communicative goals, they become more invested in mastering it. Motivation also interacts with cognitive processes in SLA. Lightbown and Spada (2021) explain that motivated learners pay more attention to input, practice more frequently, and persist through challenges.

Motivation influences their willingness to communicate, use strategies, and take risks – behaviors essential for internalizing the language system. Even learners with high linguistic aptitude require motivation to transform potential into achievement.

In recent years, emerging technologies have significantly changed the motivational landscape of language learning. Godwin-Jones (2019–2023) describes how digital tools offer personalization, immediate feedback, and multimodal learning experiences that enhance engagement. Gamification features such as points, badges, and progress visualizations can stimulate extrinsic motivation, while adaptive technology supports intrinsic engagement by matching tasks to learners' proficiency levels. Mobile-Assisted Language Learning (MALL), as explored by Kukulska-Hulme (2018–2024), provides learners with autonomy and the ability to integrate practice into daily life. Smartphones allow access to authentic materials, communication opportunities, and real-world language use, making learning more personally meaningful. Technology also enhances integrative motivation by connecting learners with global communities. Social media, online forums, and virtual exchanges allow learners to communicate with real speakers, receive feedback, and construct L2 identities. Godwin-Jones

(2021) notes that these opportunities support the Ideal L2 Self by helping learners imagine themselves as competent language users.

However, technology can also undermine motivation if not used purposefully. Distractions, information overload, and unstructured autonomy may lead to decreased focus. Kukulska-Hulme (2024) emphasizes the need for teacher guidance to help learners use technology strategically rather than passively.

Since motivation fluctuates, sustaining it over time is one of the greatest challenges in SLA. Dörnyei (2020) proposes a three-phase model: a pre-actional phase in which learners set goals and imagine their future selves; an actional phase in which they maintain effort, manage distractions, and monitor progress; and a post-actional phase in which they reflect on performance and update their goals. Teachers can support learners at each phase by encouraging realistic goal-setting, promoting self-regulated learning strategies, and fostering positive interpretations of success and failure. Brown and Lee (2018) emphasize the importance of emotional resilience: learners who adopt a growth mindset persist through challenges because they view mistakes as natural and productive aspects of learning.

Ultimately, motivation is not a fixed trait but an ongoing process shaped by psychological, social, technological, and instructional factors. The scholarship reviewed – Richards and Rodgers (2014), Harmer (2015), Brown and Lee (2018), Nation and Macalister (2020), Larsen-Freeman and Anderson (2016), Thornbury (2017), Lightbown and Spada (2021), Dörnyei (2020), Godwin-Jones (2019–2023), and Kukulska-Hulme (2018–2024) – collectively demonstrates that motivation is central to language learning success. Teachers must intentionally design motivating environments, curricula, and interactions, while learners benefit from developing self-awareness, autonomy, and future-oriented visions that sustain their engagement. As language learning becomes increasingly global, digital, and personalized, understanding and fostering motivation will remain essential to effective pedagogy. Motivation transforms language learning from an

obligation into a meaningful pursuit rooted in curiosity, identity, and the desire to connect with others.

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Tykhonova M.

HUMANITY IN THE VORTEX OF PROGRESS: BETWEEN TECHNOLOGICAL SINGULARITY AND THE SEARCH FOR LOST IDENTITY

Undoubtedly, the pace of technological advancement is accelerating with astonishing rapidity, and the world we inhabit today differs strikingly from that of merely twenty years ago. Many burgeoning technological achievements, holding the potential to fundamentally alter every aspect of our daily lives, are being researched and developed at this very moment (Anderson, 2024). Looking back, it is difficult not to notice how profoundly the very fabric of our existence has shifted. Even a decade ago, no one could have envisioned the extent to which reality would be transformed. As Melnyk (2025) aptly observes in his reflections, recalling one's childhood reveals how simple life used to be; although ten years is but a fleeting moment in human history, today, every single year brings an abundance of new

technologies, scientific discoveries, and cultural shifts. Five years ago, artificial intelligence was not ubiquitous, and smartphones and wearable gadgets were not viewed as extensions of our own bodies, yet now we cannot imagine life without them. Smart devices have granted us mobility, the ability to work, learn, and entertain ourselves from anywhere, connecting with people on the other side of the globe in mere seconds – whereas, relatively recently, a simple international telephone call was considered a luxury (Melnyk, 2025).

Before gazing into the future, it is worth analyzing the path we have already traversed. The most influential technology of the modern world has undoubtedly been the Internet, which has radically changed the way we interact with one another and with the world at large. The Web has turned the dream of instantaneous exchange of experience into reality, yet, alongside strengthening social bonds, it has introduced a multitude of new threats. As our lives slowly migrate into the digital space, the issue of privacy becomes critical. Nevertheless, slowly but surely, humanity is adapting to this new digital realm, and with each passing year, we acquire the experience necessary to exist safely within it (Anderson, 2024). In this context, science has always served as the beacon of human civilization, transforming dreams into discoveries. In the 21st century, scientific development is gaining momentum faster than ever before. Biotechnology, nanoscience, and quantum physics are but a few of the directions revolutionizing our understanding of life and the Universe. For instance, genetic engineering now allows for the correction of pathological hereditary diseases; in 2023, scientists successfully applied CRISPR-Cas9 technology to treat sickle cell anemia, a feat previously considered unattainable (Global Science Review, 2025, p. 112). Similarly, quantum computing, though still in its nascent stages, promises to transform data processing. It is astounding that Google's quantum computer, «Sycamore», performed a task in 200 seconds that would have taken classical computers 10,000 years to complete (Global Science Review, 2025).

Significant achievements in medicine allow us to forecast a future where humanity may conquer most life-threatening diseases and increase the average life expectancy to over 100 years. This becomes possible thanks to gene editing, which permits the alteration of DNA precisely where necessary. Treatment based on individual genetic characteristics is becoming the norm, while bionic prostheses and cybernetic enhancements are transitioning from medical necessities to commodities that enhance quality of life and productivity (Anderson, 2024). The Internet will become even more integrated into our daily routine, accessible not through a screen, but directly via neuro-interfaces. In this future, artificial intelligence (AI) may evolve into artificial superintelligence, becoming our loyal companion rather than our enemy. It will assist in resolving economic issues of inequality and scarcity, halt global conflicts, and assume the burden of most labor – from complex scientific research to municipal management (Anderson, 2024). The cultural consequence of this will be a shift in human purpose: whereas previous generations defined themselves through their professions, people of the future will value self-expression through art, philosophy, and poetry.

However, technology acts as a mirror reflecting our essence. While making life easier, it compels us to question whether we are losing something vital in the pursuit of speed and comfort. As noted in the work of Melnyk (2025), Albert Einstein's words that «it has become appallingly obvious that our technology has exceeded our humanity» ring truer today than ever before (p. 44). We are surrounded by devices that know more about us than we do ourselves: phones predict our thoughts, applications analyze our emotions, and social networks shape our worldview. Paradoxically, in a world where we are connected to everyone, we feel lonelier than ever. According to World Health Organization estimates, one in six people globally suffers from loneliness, a figure particularly high among the youth. Music and culture are also reacting to these changes: people have begun to sing about isolation, obsession with social media, and the fear of technological dominance (Melnyk, 2025). The ease of superficial social interactions online has triggered a

significant cultural shift toward valuing deeper, authentic relationships, leading to a renewed respect for face-to-face conversations.

Education is also undergoing radical changes, shifting from universal methods to a system oriented toward personalized learning. AI tutors, available at any time, adapt educational content to the pace of each student, allowing teachers to focus on developing logical thinking and creativity rather than the rote memorization of facts (Anderson, 2024). Engaging learning spaces, enhanced by virtual and augmented reality, allow for complex experiments or the exploration of historical sites without leaving the classroom. Yet, in this high-tech future, the concepts of security and privacy will undergo serious transformations. Our online identities will be easily linked to real persons via advanced biometric measurements, necessitating a new approach to data protection and public pressure in favor of transparency and user control over private information (Anderson, 2024). The pervasive use of connected devices means that almost every action we take is tracked, creating a demand for reliable methods to protect personal independence.

At the same time, artificial intelligence remains the central theme in the world of progress. Although systems like the da Vinci Surgical System already assist surgeons in performing operations with precision unattainable by humans, and platforms like AIVA compose music, the idea of creating technology that resembles a human causes anxiety (Global Science Review, 2025). There exists a fear that we may become part of a tragic narrative in which a super-AI destroys humanity. Isaac Asimov once said, «The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom» (Melnyk, 2025, p. 46). In 2024, the European Union introduced the first comprehensive law on AI in an attempt to control risks, yet the governance of technology always lags behind innovation. The true challenge lies not in creating a perfect world, but in creating a balanced world where innovations work for humanity, not against it. Summarizing, the view into the year 2125 does not appear as a warning of a dystopian future, but rather demonstrates the power of human adaptability. The problems we faced with the advent of the

Internet have taught us vital lessons, leading to a future where we harness the capabilities of technology for the common good. Culture is becoming increasingly participatory, where everyone can be a creator, though this leads to a certain loss of content quality in favor of quantity (Melnyk, 2025). The future we have depicted is a world where technology does not make us less human, but allows us to become healthier, smarter, and more connected with ourselves. We must stimulate our brains and train them so that artificial intelligence helps us think, rather than doing the thinking for us. Only in this way can we preserve the harmony between intellect, creativity, and compassion, for our greatest invention will never be a machine, but rather this very harmony.

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Tychonowa O. S.

DIE BEILAGE DER ZEITSCHRIFT «NIWA» AUS DEN ARCHIVBESTÄNDEN DER W. G. KOROLENKO-BIBLIOTHEK ALS QUELLE DER HISTORISCHEN ANTHROPOLOGIE

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Die Archivbestände der Staatlichen Wissenschaftlichen W. G. Korolenko-Bibliothek Charkiw (ChDNB) stellen eine unerschöpfliche Schatzkammer für AlltagsforscherInnen dar, da sie Dokumente bewahren, die eine Rekonstruktion der «lebendigen Geschichte» vergangener Jahrhunderte ermöglichen. Einen besonderen Stellenwert nimmt dabei die Sammlung illustrierter Beilagen zu periodischen Publikationen des Russischen Kaiserreiches ein, insbesondere der legendären Zeitschrift «Niwa» sowie der spezialisierten Ausgaben «Pariser Moden» (Parischskija mody). Die erhaltenen Bibliothekskarten, welche die Verfügbarkeit der Exemplare dokumentieren, umreißen ein breites chronologisches Panorama: In den Beständen werden sorgsam Zeitschriften aufbewahrt, beginnend mit dem Jahr 1876, über die 1880er Jahre, bis hin zu den für das Reich umwälzenden 1900er Jahren und

dem Jahr 1905 (ChDNB W. G. Korolenko, 1876–1905). Dieser zeitliche Rahmen – beinahe dreißig Jahre – erlaubt es, nicht nur die Evolution des Kleiderschnitts nachzuvollziehen, sondern auch den Wandel der Lebensweise, der Geschlechterrollen und gesellschaftlichen Ideale an der Schwelle zweier Epochen: vom stabilen Viktorianismus zur dynamischen Moderne. Eine komplexe Analyse dieser Quellen durch die Brille der historischen Anthropologie verwandelt die vergilbten Seiten in Zeugnisse fundamentaler kultureller Verschiebungen.

Betrachtet man dieses Dokumentenmassiv in der chronologischen Abfolge, die von den Archivdaten diktiert wird, werden wir Zeugen eines dramatischen Wandels der weiblichen Silhouette, der ein direktes Spiegelbild der Veränderung sozialer Disziplinierungsmechanismen ist. Die Gravuren der frühen Periode der Sammlung (Ende der 1880er Jahre) demonstrieren das Apogäum des sogenannten «Tournüren-Stils». Der weibliche Körper wird in dieser Phase als architektonisches Objekt gesehen, das einer strengen Reglementierung unterliegt. Die auf den Seiten dargestellten Kleider mit komplexen Polsterungen (Tournüren) und extrem geschnürten Korsetts verwandeln die Frau in eine monumentale, jedoch statische Figur (Pariser Moden, 1889, S. 25). Die anthropologische Analyse eines solchen Kostüms zeugt von einem hohen Grad sozialer Kontrolle: Die Kleidung disziplinierte den Körper faktisch, indem sie die Schrittweite begrenzte (Steele, 2001, S. 148) und eine bestimmte, repräsentative Verhaltensweise diktierte. Die Frau in der Garderobe des Modells 1889 erfüllte die Funktion der Statusdemonstration der Familie (Kirsanova, 1995, S. 169) und der «Befreiung» von physischer Arbeit. Selbst sogenannte «Visitenkostüme» blieben sperrige Konstruktionen, die erhebliche Anstrengungen für die Fortbewegung erforderten.

Die Situation ändert sich beim Übergang zu den Materialien des frühen 20. Jahrhunderts grundsätzlich. Die starre Geometrie wird von der für den Jugendstil, Art Nouveau, charakteristischen S-Linie abgelöst. Obwohl das Korsett bestehen bleibt, transformiert sich seine Konstruktion und schafft eine neue Ästhetik des «Fließenden» (Pariser Moden, 1905, S. 12). Das wohl aussagekräftigste Zeichen der

anthropologischen Wende in den Archivmaterialien ist jedoch das Erscheinen spezialisierter Kleidung für aktive Freizeitgestaltung. Eine Gravüre aus dem Jahr 1905 mit der Darstellung eines Fahrradkostüms (verkürzter Rock und Jackett) ist ein wahres visuelles Manifest der Emanzipation. Das Fahrrad verlieh der Frau autonome Mobilität, und die Mode reagierte augenblicklich auf diesen Bedarf, indem sie das «rationelle Kostüm» schuf. Dies ist ein prägnantes Beispiel dafür, wie der technologische Fortschritt durch die Mode die Körperpraktiken veränderte: Der weibliche Körper hörte auf, lediglich ein Objekt der Betrachtung zu sein, und wurde zum Subjekt aktiver Handlung im öffentlichen Raum (Ruane, 2009, S. 134).

Nicht minder wichtig für die anthropologische Analyse ist der textliche Inhalt der Zeitschriften. Die Modellbeschreibungen sind reich an spezifischer Terminologie, was von einer hohen Konsumkultur und einer tiefen Sachkenntnis des Publikums in der Materialkunde zeugt. Die Zeitschrift fungierte als praktischer Leitfaden der Hauswirtschaftslehre. Das Vorhandensein detaillierter Instruktionen und Erwähnungen von Schnittmustern weist darauf hin, dass ein beträchtlicher Teil der Leserinnen den «Pariser Chic» selbstständig reproduzierte (Pariser Moden, 1905, S. 14). Dies eröffnet den Forschenden die Ebene der kreativen Frauenarbeit, wobei die Modebeilage eine demokratisierende Funktion erfüllte, die es der provinziellen Mittelschicht erlaubte, die Codes der hauptstädtischen Aristokratie zu imitieren (Simmel, 1905, S. 26).

Besonderes Interesse wecken Rubriken, die über die Kleidung hinausgehen, wie etwa Stickmuster für Haushaltsgegenstände – Mappen für Zeitschriften oder Schreibunterlagen. Dies verweist auf die Rolle der Frau als Kuratorin des privaten Raums, verantwortlich für die Ästhetisierung des Alltags. Zudem verwandelte das Vorhandensein von Feedback-Rubriken wie dem «Briefkasten» die Zeitschrift in eine interaktive Kommunikationsplattform und formte eine imaginierte Gemeinschaft der Leserinnen (Pariser Moden, 1905, S. 15). Ebenso fixieren die Zeitschriften den Kontrast zwischen Alltag und Fest: Neben praktischen Kostümen sehen wir prunkvolle Maskerade-Outfits, die für die Frau ein legaler Weg waren, die

Grenzen der strengen Etikette zu überschreiten und eine andere Identität anzuprobieren (Wainshtein, 2006, S. 295). Somit stellen die Archivexemplare der Beilagen der Zeitschrift «Niwa» aus den Beständen der ChDNB W. G. Korolenko eine einzigartige Quelle dar, die die Evolution der Frau von der «Zierde des Salons» zur aktiven Teilnehmerin des städtischen Lebens dokumentiert.

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SUBTLETY OF MACHINE TRANSLATION IN AN EPOCH OF GLOBAL TECHNOLOGIES

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The translation industry is undergoing significant changes due to the rapid development of technology in the era of global transformation, which simplifies many aspects of the translation process. Modern languages evolve, and new opportunities for translators are continuously emerging – for example, electronic dictionaries, machine translation systems, and computer-assisted translation tools.

These innovations influence both translators and clients. When a text is translated by a machine, the cost of the service is usually lower than that of a human translation. As a result, machine translation systems such as *Google Translate* and *DeepL*, as well as CAT tools like *OmegaT* and *Wordfast*, have become increasingly popular. The combination of technological solutions and human intelligence makes it possible to optimize translation workflows, which contributes to the development of translation studies and related fields.

Main Approaches to Translation

There are two fundamental approaches to translation:

– *free translation* focuses on conveying the original meaning and stylistic features and allows the translator to depart from literal correspondence;

– ***l****iteral translation* aims at reproducing the lexical and grammatical structure of the source text as accurately as possible.

Both approaches have their advantages and are chosen depending on the context and the purpose of the translation.

Technologies and Challenges in Translation

Technological development has significantly influenced translation activity, yet the quality of machine translation remains imperfect. For example, the term *"institutional reform"* is sometimes incorrectly rendered into Ukrainian as *інституційна установа*, while the correct translation is *реформа установ*. One of

the key challenges of machine translation lies in rendering polysemantic words and fixed expressions. Technologies often fail to recognize context, which leads to errors.

Examples include:

Give me a hand – not *Дай мені руку*, but *Допоможи мені*.

Break the news – not *зламати новини*, but *повідомити новину*.

Run out of time – not *вибігти з часу*, but *не встигати / час спливає*.

Hit the books – not *вдарити книги*, but *сісти за навчання*.

These examples demonstrate the need for human supervision in the translation process, especially when dealing with idioms.

The Role of the Translator in the Age of Technological Progress

Despite the active use of artificial intelligence in translation, the role of the human translator remains essential. A translator conveys not only meaning but also interlingual and intercultural nuances, which play a crucial role in communication.

Future research in translation studies may address the following aspects:

– typology of discrepancies between languages;

– differences in linguistic norms of the source and target languages;

– correct selection of dictionary equivalents for polysemantic words;

– ethical aspects of translation activity.

It is also important to consider existing problems in the translation field, including insufficient funding, the low professional status of translators, and the lack of qualified translation criticism.

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INTERACTIONS OF SCIENCE, TECHNOLOGY AND CULTURE IN THE FORMATION OF FUTURE SOCIETAL TRAJECTORIES

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The future represents not merely a distant temporal endpoint but an ongoing socio-technological trajectory shaped by current scientific discoveries, technological development, and cultural evolution. Contemporary transformations in these domains influence both functional capabilities and human identity, thereby redefining how individuals conceptualise agency, morality, and collective progress. This work examines the potential futures that may emerge from the convergence of scientific innovation, technological integration, and cultural creativity, analysing how these forces could structure daily life and intergenerational experience in the coming decades.

Scientific research has historically expanded the boundaries of human knowledge and capability. Biomedicine is expected to remain a focal area of transformation, particularly due to advancements in genetic engineering, precision medicine, and nanotechnology. Researchers predict that gene-editing techniques such as CRISPR may enable early intervention against hereditary diseases, while personalised treatment protocols will be optimised using individual genomic data (Doudna & Sternberg, 2017). Concurrently, nanomedical systems may facilitate internal physiological repair and monitoring, thus altering biomedical practice and prolonging functional health spans (Freitas, 2010). These developments raise critical ethical questions regarding human enhancement, distributive justice, and regulatory oversight.

Space exploration constitutes a further scientific domain with profound long-term implications. Commercial and governmental initiatives indicate increasing feasibility of Martian settlement and multi-planetary habitation (Milligan, 2020). Such undertakings would shift human perception of planetary belonging, reframing Earth not as a singular origin but as one node within a broader spatial ecosystem. At

the environmental scale, scientific approaches to climate resilience are becoming increasingly central. Novel carbon capture systems, biodiversity restoration tools, and autonomous monitoring technologies are positioned to support sustainable planetary stewardship and ecological adaptation (Rockström et al., 2009).

Technological systems translate scientific theory into societal application. Artificial intelligence (AI) exemplifies this transition, influencing education, communication, and labour markets. AI-based personal assistants may monitor cognitive load, manage behavioural health, and support continuous learning, thereby functioning as adaptive socio-technical companions (Shneiderman, 2020). Robotics may extend beyond industrial contexts into domestic care, artistic production, and pedagogical environments, generating new human-machine interaction paradigms.

Immersive systems such as virtual reality (VR) and augmented reality (AR) may restructure communication and knowledge acquisition. VR learning environments already demonstrate potential to dissolve geographical barriers, enabling synchronous collaboration across dispersed populations (Slater & Sanchez-Vives, 2016). Smart city infrastructures are likewise anticipated to expand, incorporating autonomous vehicles, adaptive energy grids, and circular waste systems. Such urban systems are frequently conceptualised as cyber-physical organisms that optimise resource flows and environmental impact while enhancing quality of life.

While science and technology extend operational possibilities, culture provides interpretative frameworks that determine how such possibilities are deployed. Cultural systems influence ethical norms, identity formation, and collective value orientation. The emergence of digital art forms, interactive performance spaces, and emotion-responsive media signals a diversification of aesthetic practices in technologically mediated contexts. These practices encourage participatory creativity, wherein audiences become co-creators rather than passive observers.

Simultaneously, cultural heritage and intercultural exchange maintain stabilising roles, fostering continuity and moral discourse. As biotechnology and AI challenge foundational assumptions about embodiment, cognition, and personhood, cultural systems will become increasingly critical for articulating questions of agency, responsibility, and human dignity. In global contexts, culture will shape debates concerning equitable access to technology, respect for diversity, and ethical governance of scientific capabilities.

The projected trajectory of scientific and technological expansion entails considerable risks. Algorithmic bias, unequal access to enhancement technologies, and over-dependence on automated systems threaten to deepen social stratification and reduce human autonomy. Consequently, scholars argue for anticipatory governance frameworks and ethical education to ensure that innovation aligns with principles of justice and human wellbeing (Floridi & Cowls, 2019). The central challenge involves balancing innovation with stewardship, prioritising empathy, moral reasoning, and inclusive decision-making.

Summing up, the future will be co-constructed through interactions between scientific advancement, technological application, and cultural interpretation. Although substantial uncertainty persists, the interplay of these forces holds the potential to enhance environmental sustainability, augment human capability, and expand cognitive and creative boundaries. However, realising such outcomes requires sustained ethical reflection, interdisciplinary collaboration, and societal responsibility. The future should therefore be viewed not as an autonomous phenomenon imposed upon humanity, but as a domain shaped through collective human agency and deliberation.

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Zhuha A. S.

JOURNEY INTO THE FUTURE: SCIENCE, CULTURE AND HUMANITY'S RESPONSIBILITY

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The future has always attracted people's attention. We have tried to look ahead in every era – from ancient prophecies to modern scientific predictions. ‘Journey into the future’ is not only about fantasies of flying cities or spaceships but also an attempt to imagine what we will become, what values will be most important to us, and how our habits and culture will change. Today, science and technology are developing so rapidly that the future seems much closer than we are used to thinking.

Science plays a significant role in shaping the world (Рубанець, 2013). In the 20th century, computers, nuclear energy and the first human flight into space were revolutionary. In the 21st century, we are already seeing new development directions. Technologies that allow us to edit genes and treat hereditary diseases are emerging in medicine. Perhaps in the future, every person will have their own ‘genetic

passport,' which doctors will use to select the best treatment. Artificial intelligence can recognise diseases from medical images faster than doctors, and in the future, it may become an assistant in education, city management, and economic planning. Humanity will also continue to explore space: ideas about colonies on Mars or the search for life on other planets are no longer science fiction and are becoming real scientific programmes.

Another promising field is the development of robotics. Robots already assist in manufacturing, medicine, and even caring for older people. In the future, such machines will be able to perform even more tasks, from complex rescue operations to working in hard-to-reach places, such as the seabed or the surface of distant planets. At the same time, nanotechnology will develop, creating devices and materials at the molecular level. Nanorobots can deliver drugs directly to cells, and new materials will become stronger and lighter than any known today.

Technology makes scientific ideas a reality. Cities of the future could become 'smart': with driverless transport, networks of sensors monitoring air quality, and buildings that save energy themselves. Imagine studying or working in virtual spaces without familiar boundaries – this is becoming possible thanks to virtual and augmented reality. Quantum computers can solve highly complex problems in seconds and help develop new medicines or predict natural processes. At the same time, environmental innovations – new energy sources, biodegradable materials – can reduce the damage that humanity causes to nature. However, new opportunities come with new questions: how to protect privacy and prevent technological inequality between countries and people.

Another rapidly changing area is energy. Humanity is already moving away from fossil fuels and switching to renewable sources, such as solar and wind power plants and geothermal energy. In the future, completely new solutions, such as controlled thermonuclear fusion, will provide an almost unlimited and environmentally friendly energy source. This will pave the way for developing new

modes of transport, large-scale space missions and a stable energy supply even for the largest megacities.

Culture will not be left behind either. The internet and rapid communications are making the boundaries between cultures increasingly blurred – people from different parts of the world exchange traditions and ideas, which helps to enrich each other. New art forms are emerging – digital paintings, music created by artificial intelligence, and interactive exhibitions that allow the viewer to participate in the creation process. At the same time, society is rethinking its values: environmental awareness, equal opportunities and inclusiveness are becoming increasingly important. And modern technologies offer a chance to preserve the past – 3D scanning and digital archives will help future generations to see monuments even when they no longer exist in physical form.

The culture of the future may become even more closely linked to education. New technologies will enable people worldwide to study at leading universities, participate in international creative projects, and collaborate on books, films, or music. At the same time, new forms of communication will develop – visual and multimedia forms that combine text, sound and images into a single whole. This will expand the boundaries of art and make culture even more diverse.

But a journey into the future is not only inspiring, it also presents challenges. We face global problems: climate change, depletion of natural resources, and the danger of increasing inequality between rich and poor countries. Complex ethical questions also arise: Is it possible to change the human genome? How safe are autonomous machines? Who will be responsible for the decisions made by artificial intelligence? These problems can only be solved through joint efforts – international cooperation, responsible science and the understanding that we all live on the same planet.

So, travelling into the future is not a fairy tale or the plot of a science fiction film. We are already making this daily journey – through our discoveries, decisions and even small habits. Science provides the tools, technology opens up new paths,

and culture shapes our values. Whether we combine progress with humanism and preserve respect for nature and cultural heritage will determine what the world will be like tomorrow. The future is not only about expectations, but also about responsibility for what we are creating today.

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SOCIAL SCIENCES

Aleksandrov D. M.

THE ROLE OF ENGLISH LANGUAGE PROFICIENCY IN UKRAINE'S HIGHER EDUCATION

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English language competence has become a central element of Ukraine's national education strategy and its broader post-war recovery agenda. As the principal language of scientific communication, international mobility, and global cooperation, English is embedded in the modernisation goals of Ukrainian higher education. Today, the ability to communicate, study, and conduct research in English is seen not only as a linguistic skill but as a fundamental requirement for participating in global academia. The internationalisation of higher education is closely linked to improving the quality of English teaching and learning across universities (Orzhel et al., 2023). Consequently, strengthening English instruction has become a strategic priority for institutions seeking alignment with European standards and deeper integration into global educational space.

This article explores the contemporary role of English in Ukrainian higher education, identifies the academic, professional, social, and cultural benefits English proficiency offers to students, and outlines innovative teaching methods that reflect current European approaches.

English is now the dominant language of global research, with over 85% of international scientific publications produced in English (Westerlund et al., 2023). For Ukrainian universities, integrating English across disciplines has therefore become a prerequisite for meaningful participation in European academic networks and research projects. English is also essential for accessing international grants, participating in cross-border research consortia, and engaging with widely used academic platforms and journals. Without a sufficient level of English proficiency,

scholars face significant limitations in visibility, collaboration, and global engagement.

The Government of Ukraine has reinforced this priority. The Cabinet of Ministers identifies English-language competence as a key objective of the State Target National-Cultural Program for 2026–2030, which aims to ensure that all graduates attain at least a B2 proficiency level. This target reflects a broader vision of creating a competitive, innovative, and internationally integrated higher education system. By embedding English as a core component of professional training across fields such as engineering, medicine, law, and economics, national policy seeks to equip future specialists with skills required to engage in global dialogue.

Debych M. argues that strengthening English-language education enhances Ukraine's presence in the European Higher Education Area and facilitates international collaboration crucial for the country's recovery. The ability to communicate in English allows universities to participate in exchange programmes, dual-degree initiatives, and multinational research partnerships. Similarly, Torubara O. notes that English increasingly symbolizes Ukraine's openness and commitment to innovation, positioning it not as a foreign linguistic element but as a bridge to Europe and the global academic community. This shift reflects a broader cultural and political orientation toward Western integration.

The paper now turns to the benefits of English language proficiency for Ukrainian students.

Academic Benefits

Students with strong English skills gain access to international journals, conferences, academic databases, and research networks. Westerlund R. claims that students enrolled in English-medium instruction (EMI) programmes produce higher-quality research and demonstrate stronger motivation to engage in international scholarly publishing.

Professional Benefits

In today's labour market, English proficiency is a major determinant of employability. Debych M. highlights that Ukrainian graduates with English skills are more competitive in European and global employment sectors, particularly in multinational companies, NGOs, and EU-funded programmes. Employers increasingly view English not merely as a communication tool but as a strategic professional competency.

Social and Cultural Benefits

English also enhances students' access to international mobility schemes such as Erasmus+, DAAD, and Fulbright. According to Torubara O., participation in such programmes fosters intercultural competence, tolerance, and global citizenship – qualities essential for the next generation of Ukrainian professionals. Through interactions with students and scholars from other countries, Ukrainian students develop broader worldviews, improve soft skills, and become more adaptable and resilient. These qualities are crucial in the context of Ukraine's social and economic reconstruction.

Despite significant progress, Ukraine continues to face challenges in modernising English instruction. Westerlund R. notes that many programmes still prioritise grammar-translation approaches rather than communicative competence. Uneven access to teacher training and educational resources across regions further complicates reform efforts.

The COVID-19 pandemic accelerated the digitalisation of Ukrainian higher education. Universities increasingly rely on blended and hybrid learning models that combine digital platforms (e.g., Moodle, Zoom, Quizlet) with traditional classroom instruction. These approaches have proven especially valuable for students from war-affected regions, ensuring continuity and flexibility in learning.

Content and Language Integrated Learning (CLIL) is gaining traction as an effective instructional approach. By merging subject and language learning, CLIL enhances students' ability to use English in professional fields such as engineering,

economics, medicine, and law (Debych, 2023). Its adoption supports Ukraine's shift toward bilingual professional communication aligned with EU standards.

The Cabinet of Ministers calls for institutional strategies that prioritise continuous professional development for English teachers and promote partnerships with the British Council, GoGlobal, and other international organisations. Torubara O. emphasises the need for language policies that support ecosystems of academic English practice involving teachers, researchers, and students.

In conclusion, English language proficiency is a cornerstone of Ukraine's integration into the European and global academic community. Scholars such as Westerlund, R., Chugai, O., Petrenko, S., Zuyenok, I. and Torubara O. underscore that English serves not only as a medium of communication but as a transformative force that strengthens academic quality, enhances employability, and promotes intercultural understanding.

While Ukraine rebuilds its education system, English emerges as a strategic resource that empowers young people to participate in global knowledge production, establish international partnerships, and contribute meaningfully to the country's recovery and modernisation.

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Aliabieva Ya. V.

FUTURE OF EDUCATION: SHOULD STUDENTS LEARN ONLY SUBJECTS THEY LIKE?

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Should students learn only subjects they like? Education is one of the most powerful tools that shape the lives of individuals and the future of societies. Every country invests enormous resources in its education system, aiming to prepare students not only for careers but also for life as responsible citizens. A key debate in education is whether students should be allowed to study only the subjects they enjoy or whether they should follow a curriculum that includes a broad range of disciplines, even those they might dislike. At first glance, focusing only on preferred subjects appears appealing, as it can increase motivation and enthusiasm. However, education is not merely about pleasure or personal choice, it also involves discipline, preparation for adulthood, and the development of critical life skills. In my view, students should not study only the subjects they like but should instead follow a

balanced system that combines core subjects with electives of personal interest (Westford University College, 2022).

A strong argument for requiring students to study a wide range of subjects is that life itself demands versatility. A well-rounded education equips students with fundamental skills that they will inevitably need, regardless of their career path (National Research Council, 2012). For instance, mathematics provides problem-solving abilities and logical thinking, skills that are useful not only for scientists and engineers but also for ordinary situations such as financial planning, shopping, or even cooking with measurements. Similarly, subjects such as literature and history develop critical thinking, empathy, and communication – skills necessary for building relationships, understanding cultures, and participating in civic life. Without exposure to these subjects, students risk becoming highly specialized but poorly equipped for the basic demands of adult life. Furthermore, modern workplaces expect flexibility. Few careers are based on a single skill or subject. An architect, for example, must combine design (art), engineering (mathematics and physics), and communication (language and literature). A medical doctor must not only master science but also communicate clearly with patients and understand ethical questions. Thus, a broad education does not waste time, it builds a toolkit for success in any field (Alison, 2017-2018).

Another significant reason for learning multiple subjects is that students often do not know their true passions or abilities until they try different fields. A teenager who claims to dislike science may change their opinion after conducting exciting experiments in a chemistry lab. A student uninterested in history may become fascinated when studying a particular era or leader. By experiencing a wide range of disciplines, students have the opportunity to discover talents they never suspected. There are countless real-world examples of individuals who discovered their careers in unexpected ways. Steve Jobs, the co-founder of Apple, famously credited a calligraphy class – something far outside his main interest at the time—for inspiring the elegant typography of Apple computers (Wagner, 2012). Without exposure to

that seemingly irrelevant subject, technology as we know it today might look very different. If students were limited only to the subjects they initially liked, such life-changing discoveries would never occur. At the same time, giving students full freedom to avoid disliked subjects carries serious risks. Children and teenagers often prefer activities that are easy or entertaining, while avoiding those that challenge them. This can lead to a lack of resilience and problem-solving skills, qualities that are built through tackling difficult tasks (Dweck, 2006). Moreover, society as a whole depends on a balanced distribution of knowledge. If too many students abandon mathematics and science, the future workforce may lack doctors, engineers, and researchers. If too many avoid literature and history, society may lose its sense of culture, critical thinking, and ethical understanding. Education is not only a private benefit but also a public good, and a selective curriculum may satisfy students in the short term but harm society in the long run.

It is important, however, not to dismiss the value of motivation. Students who are forced to study subjects they absolutely dislike may lose interest in school altogether. Motivation is a key factor in learning, and enjoyment often leads to deeper understanding and creativity (Ryan&Deci, 2000). For example, a student who loves music may spend hours practicing without being told, achieving mastery that a forced learner could never reach. Therefore, education systems should not ignore students' interests and passions. Nevertheless, passion alone is not enough. Motivation can also be cultivated through good teaching methods, real-life applications, and supportive environments. A student who dislikes mathematics may change their mind if shown how math is used in video game design or sports statistics. Teachers and curricula should work to connect "boring" subjects to students' lives, making them meaningful. In this way, even difficult or less popular subjects can become engaging, reducing the temptation to abandon them entirely. The best solution is balance: students should not be allowed to study only their favorite subjects, nor should they be forced into a rigid curriculum with no freedom of choice. Instead, a system that requires essential core subjects such as mathematics, science, and

language while allowing students to choose electives in art, music, technology, or sports can provide the best of both worlds. Core subjects ensure a solid foundation of necessary skills, while electives allow students to pursue passions, develop motivation, and express creativity. This approach reflects real life. Adults also balance responsibilities they may not enjoy, such as paying bills, with activities they love, such as hobbies or sports. Education should prepare students for this reality. By teaching both discipline and freedom, schools can produce individuals who are not only knowledgeable but also adaptable, motivated, and well-prepared for the future (Westford University College, 2022).

In conclusion, the idea of allowing students to study only the subjects they like is attractive but unrealistic. A narrow education would limit opportunities, weaken essential skills, and harm society as a whole. A well-rounded education, on the other hand, equips students with vital tools, exposes them to hidden talents, and prepares them for both personal and professional life. At the same time, respecting student choice through elective subjects fosters motivation and creativity. Therefore, the most effective education system is one that combines required core subjects with optional areas of interest. Students should not study only what they like, but neither should they be denied opportunities to follow their passions. True education is a balance between necessity and desire, responsibility and freedom. Only through this balance can students grow into successful, fulfilled, and responsible members of society (National Research Council, 2012).

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THROUGH THE MACHINE, TO THE SELF

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The impact of superhuman AI over the next decade will exceed that of the Industrial Revolution. That is a reality both thrilling and terrifying, the one we are getting closer to with every technological advancement. Humanity's journey into the future has always been marked by revolutions, the moments when progress accelerates, driven by new discoveries, tools, and ideas. Each of these technological leaps changes not only how people work and communicate but also how they see the world and themselves. As our world now stands on the edge of an era defined by artificial intelligence, automation, and biotechnology, it becomes increasingly important to ask: how many more revolutions will it take for humanity to understand that rapid progress always has a price? Science, culture, and technology are deeply

connected, forming a cycle where innovation brings both progress and consequences, a clear pattern that has defined the development of civilization.

The First Industrial Revolution, starting in the late 18th century, began the age of machines. Steam power, textile factories, and new production methods transformed farming societies into industrial ones (Mokyr, 1999). The scientific curiosity of the Enlightenment age helped make this possible, yet the human cost was great. Workers left villages for crowded cities and worked in unsafe conditions for little pay. Science was seen as a force of freedom, something that could improve life through mastery over nature. However, culture showed another side of this progress, that being pollution, inequality, and the exploitation of labor. The first revolution taught humanity how to harness power, but not how to manage its consequences.

The Second Industrial Revolution, in the late 19th and early 20th centuries, brought electricity, mass production, and the first communication networks such as the telegraph and telephone. The rapid expansion of electrical power and standardized manufacturing reshaped daily life and global economic structures (Perez, 2003). Science became more systematic and professional, allowing steady technological growth. Everyday life changed quickly as machines and electric lights entered homes and cities. People began to believe in endless progress, convinced that technology could solve every problem. But again, progress had a price. Factories grew larger, pollution increased, and wars became more destructive. Electricity gave light to the world, yet it also revealed new moral challenges, from the exploitation of natural resources to the rise of industrial warfare. Humanity entered an age of comfort and connectivity but also of greater dependence on machines. This second revolution showed that progress was not only mechanical but moral. Each innovation demanded responsibility.

The Third Industrial Revolution, beginning in the mid-20th century, introduced the digital age. The creation of computers, the internet, and later mobile devices reshaped nearly every aspect of life, leading to what is often described as the early digital economy (Tapscott, 1996). Science and technology became tightly

connected, with data replacing materials as the key to innovation. Culturally, humanity experienced its first global network of instant communication. People could share knowledge and ideas from anywhere, but this came with new problems. The digital world brought misinformation, constant distraction, and loss of privacy, phenomena scholars describe as symptoms of the emerging surveillance economy (Zuboff, 2019). The gap between those who understood technology and those who did not created new inequalities. The cost of progress was no longer just physical but psychological and informational. Humanity learned that being connected does not always mean being understood and that convenience can come at the expense of authenticity.

Today, the Fourth Industrial Revolution is underway, defined by artificial intelligence, robotics, biotechnology, and automation (Schwab, 2016). Machines are no longer only tools but partners, decision-makers, and even creators. Science continues to break boundaries, from gene editing to quantum computing, while culture struggles to adapt to this new reality. This revolution offers huge potential, from better healthcare to cleaner energy and smarter cities. Yet it also brings serious risks. Automation threatens jobs and poses complex economic trade-offs (Acemoglu & Restrepo, 2018), AI challenges ideas of creativity and morality, and privacy becomes harder to protect. Unlike past revolutions, the current one is happening faster than society can possibly adapt. The key question now is not whether technology can do something, but whether it should.

Looking back, a clear pattern can be observed. Science opens new doors, technology walks through them, and culture tries to deal with the consequences. Each era faces the same challenge: will humanity's creativity be matched by its sense of responsibility? The costs of progress have changed with time. The first revolution brought physical hardship, the second harmed the environment, the third created digital overload, and the fourth, the ongoing era, brings moral and existential doubts (Tegmark, 2017). Looking at the costs, it becomes clear that progress has been shaped more by ambition than by reflection.

Still, the future does not have to repeat the past. To move forward wisely, humanity must rethink what progress truly means. The next revolution, whether it comes from artificial intelligence or space exploration, should focus on balance and sustainability. Education and culture must teach people to question technology's role and purpose. Science should aim not only to discover but also to understand. Technology should serve people's well-being, not replace it. Only through this balance can progress become steady and meaningful, rather than a series of costly leaps.

In the end, the journey into the future is not just about invention but also about self-awareness. Every industrial revolution has increased humanity's power while testing our wisdom. Real progress is measured not by speed but by direction, not by how fast society moves forward, but by how carefully we choose our path. Perhaps one more revolution will be needed, or, perhaps, understanding itself can be the next great step. We as humanity still hold the power to decide whether the cost of progress will remain a burden or become a lesson learned. We chased perfection through machines, yet the answer still lies in humanity. Ambition built the world ahead of us; reflection will decide if we can live in it.

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ADVANCEMENTS IN HUMAN HORIZONS

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Humanity has always been deeply amused by the tantalising idea of the captivating future. From the very beginning of the civilisation, people have been trying to predict what lies ahead. Today, though, the pace of change is unprecedented, and the future no longer seems something distant and unattainable but rather unfolds and shifts as we speak. In today's fast-paced digital world, with rapid advances in science and technology, and with cultures becoming inextricably linked, we become the witnesses of constant changes in a tangible reality. So, how may development in science, culture, and technology form our journey into the years to come?

Science

Science has already drastically changed the way we live life, but its future potential is even more multifaceted. For instance, medical field experiences numerous breakthroughs. Diseases once thought incurable may be eliminated through bleeding-edge innovations. COVID-19 demonstrates that new vaccines and treatments are now developed quickly. With the assistance of VR and AR it is now feasible to explore the human body in more sophisticated ways, helping people live longer, healthier lives. At the same time, the fusion of biotechnology and artificial intelligence could redefine what it means to be human, raising fundamental questions about our identity and ethics.

Moreover, space exploration, once the realm of fantasy, is now becoming a common tool. Surely, there are such aspects as ambitious missions to Mars, but the

practical utilisation of space technologies is already impacting our routines. We have indispensable tools such as GPS navigation, pretty accurate weather forecasting, and satellite television at our disposal. In the near future, advancements in space science could enhance global communication, improve the features that we already have, help us manage natural cataclysms more efficiently, and even deepen our understanding of our planet's fragile systems. Space is not something distant and abstract anymore, it is becoming our ally in solving daily problems.

Another valuable point to mention is the environment. Recycling technologies are gradually advancing, making resource use more effective and waste reduction more realistic than ever. Renewable energy is replacing fossil fuels, making daily life cleaner and more sustainable. Scientific innovation also provides more ethical alternatives for the treatment of animals: animal testing may soon be rendered obsolete by futuristic simulations and lab-grown tissues. Moreover, the development of artificial meat can result in reducing industrial farming, in minimising emissions, and upgrade the way we treat animals. This way, progress intertwines with environment, giving society a chance to be in a healthier and more balanced coexistence with nature.

Culture

Alongside scientific progress, cultural identity will continue to form the future in profound ways. The art world is becoming more and more interconnected through globalisation. On the one hand, this opens the door to cultural exchange, allowing traditions, languages, and art forms to be shared. On the other hand, it may cause adverse effect on the variety of creations, where unique identities risk being superseded by global tendencies. The challenge that we are about to face will be not to jeopardize heritage while embracing shared values. If this balance is reached, culture will not only survive but also become richer, more thought-provoking, complex, and more resilient in the face of conflict.

These tendencies can already be seen in everyday life. Today, traditions, languages, and artistic expressions cross borders almost instantly, transforming how

people experience culture. Social media is a prime example: it accelerates the spread of slang – new words are becoming fashionable loanwords, which youth picks up in a blink of an eye. This shows how culture now is less tied to geography and more shaped by the ways we connect, share, and create together.

Another sphere to consider is cinematography. Streaming services extend the dynamics of sharing cultures further: foreign films and series (Squid Game, Money Heist, Cassandra) reach big audiences around the world, fostering cultural exchange though spreading of mainstream preferences.

Fashion provides another compelling example of reflecting our outlook on life. Global trends, modelling, and the borrowing of styles from different cultures are adopted across countries, creating aesthetic similarity. Thrifting and second-hand shopping have also become international movements, turning ecofriendly fashion into a cultural statement. Together, these trends show how style has grown into a means of expressing collective values like environmental awareness, creativity, and interconnectedness, reflecting the global circulation of ideas and practices.

Technology

Technology is undoubtedly the driving force of our age, and its influence will only increase down the line. It has become a powerful conduit for selfexpression, allowing people to create, share, and bond in modern ways. Life is now unimaginable without smartphones: they serve as tools for banking, online shopping, entertainment, making them an integral part for billions. Online learning platforms such as Zoom, Google Classroom, Miro and Duolingo have similarly revolutionised education, providing an opportunity to obtain knowledge anytime and anywhere.

The current situation in Ukraine demonstrates how technology influences not just daily life, but survival itself. FPV drones, satellite internet, and advanced cyber defence systems have shown how technological ingenuity can choose the fate of the whole country. At the same time, Ukraine's IT sector – despite the war – has emerged as a space of resilience and innovation, producing solutions that may have applications far beyond the battlefield.

Yet technology is a double-edged sword. While it offers countless advantages, it can also be risky: loss of privacy, over-dependence on machines, and stigmatising those without access to the latest tools. Considering the tendency of over-reliance on technology, it is crucial that people use it in moderation. How well we manage this situation will determine whether technology becomes a blessing or a burden. So basically, we are the ones responsible for our future existence.

The journey into the future is not merely waiting to see what happens. It is a collective effort shaped by choices in science, culture, and technology. If used wisely, science can expand human horizons, culture can provide balance and meaning, and technology can empower individuals and societies. If managed wrong, however, they may bring division, exploitation, and hidden dangers. The future, then, is not something to be feared but something to be crafted with care, responsibility, and vision.

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THE IMPACT OF SOCIAL MEDIA ON COMMUNICATION: ADVANTAGES AND CHALLENGES

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Today it is difficult to imagine modern life without social media. Platforms such as Facebook, Instagram, TikTok, and YouTube have become an essential part of our everyday routine. We use them to send messages, share photos, read news, watch videos, and keep in touch with people from different parts of the world. For many individuals, checking social media has become as natural as drinking morning

coffee. Because communication plays such a significant role in human life, it is important to understand how these platforms influence the way we talk, interact, and understand one another. They shape not only our habits, but also our values and expectations for communication.

In the past, communication was more personal and slower. People preferred face-to-face conversations, handwritten letters, or telephone calls. These methods allowed for more emotional expression, and people often felt more connected during such interactions. Today**,** communication happens much faster. A message sent online can reach another person almost instantly, even if they live on a different continent. This speed and convenience are some of the main reasons why social media has become so widespread. It has also changed the rhythm of our daily life, making constant communication feel normal.

According to the DataReportal Digital 2024 analysis, Ukraine had around 24.3 million social media users, which is approximately 65% of the population. This number demonstrates that social media has become one of the most popular tools for communication in the country. Students use it to contact classmates and teachers; families stay connected across long distances; and people easily meet others who share similar interests. Social media allows us to remain in touch at any moment, whether for studying, working, or simply chatting for fun. It also gives people a sense of belonging to a global online community.

The language used on social media is also very different from that used in traditional communication. People often send short messages instead of long sentences. To express emotions more clearly, they use emoticons, stickers, and memes. According to a study published in *Computers in Human Behavior*, emoticons work like a “digital face,” helping users understand emotions that are difficult to convey through text alone. At the same time, new slang words, abbreviations, and jokes often appear online, creating a special communication style that is sometimes difficult to understand for those who are not active social media users. This form of language is constantly evolving, influenced by trends and viral content.

However, the simplicity and speed of online communication can create new challenges. Because messages are short and do not show tone of voice or facial expressions, misunderstandings have become more common. It is not always easy to understand whether a person is joking, serious, angry, or upset. For this reason, conflicts may arise even between close friends. Communication becomes faster but not always clearer, and emotional connection may be weaker. As a result, people sometimes feel more distant despite communicating more often.

Social media offers many significant advantages. One of the greatest benefits is the ability to stay close to people who live far away. Users can easily send photos, videos, voice messages, or updates from their daily life. It takes only a few seconds to congratulate someone on a birthday or share important news. Social media also helps users find communities based on shared interests. Students can join study groups, gamers can find teammates, and artists can share their creative work with large audiences. This helps people feel less lonely, because no matter where they live, they can always find someone who understands their passions. It also opens new opportunities for learning and cooperation.

Despite these advantages, there are also notable disadvantages. Many people communicate online much more often than they do in real life. Research shows that young people often feel more comfortable texting than speaking face-to-face. As a result, real-life communication skills may become weaker. Some students may feel nervous when speaking in university, and some young adults find it difficult to communicate confidently at work. Social media can also create unrealistic expectations. Since people usually post only the happiest and most successful moments of their lives, others may begin to compare themselves and feel that their own life is not good enough. This can have a negative effect on self-esteem and emotional well-being.

Another important function of social media is delivering news. A recent survey in Ukraine shows that about half of internet users receive their news from social media platforms. This is convenient and fast, but also risky. Not all information

online is true. Fake news spreads very quickly, and it is often difficult to distinguish what is real and what is not. Moreover, social media algorithms show users mostly the content that matches their interests and opinions. This creates an “information bubble,” where people see only similar viewpoints and rarely encounter different perspectives. As a result, society may become more divided, and people may struggle to understand opposing opinions. This can influence political decisions and public debates.

Privacy is another serious problem. Many users share too many personal details about their life, forgetting that strangers can access this information. Cases of cyberbullying, hate comments, and online harassment have also increased. These problems affect mental health and can be especially dangerous for teenagers who are more vulnerable to online pressure and negative feedback. Lack of digital safety knowledge makes the situation even more complicated.

In conclusion, social media has brought many significant changes to the way we communicate. It has made communication faster, easier, and more global. It allows us to stay in touch with distant friends and relatives, find communities with similar interests, and express ourselves creatively. At the same time, social media presents serious challenges, including misunderstandings, fake news, addiction, weakened real-life communication skills, and privacy risks. Because social media is such a powerful tool, we must use it responsibly. We should check information before believing it, protect our personal data, and continue practicing real-life communication. When used wisely, social media can be a positive and effective tool that enriches our communication instead of replacing it. It is up to us to find a healthy balance between online and offline interaction and make social media a helpful part of our everyday life.

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MODERN TECHNOLOGIES AND LEARNING FOREIGN LANGUAGES

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The digital revolution has fundamentally changed how we approach foreign language education. What once required expensive textbooks and physical classroom attendance can now happen through a smartphone during a morning commute. This shift raises an important question: which of these new tools actually work, and which are just technological novelty without substance?

Globalization and increased academic mobility have created genuine demand for multilingual professionals, pushing educational institutions to reconsider traditional methods. According to Puhachova, modern education increasingly relies on information and communication technologies, multimedia resources, and online platforms to boost student motivation and enable personalized learning paths. However, the abundance of available tools can be overwhelming, making it crucial to identify which technologies deliver meaningful results (Puhachova, 2023).

This study examines current digital technologies that facilitate foreign language acquisition, analyzing their practical benefits and limitations. Rather than simply cataloging available tools, it aims to evaluate their real-world effectiveness based on existing research and personal experience.

Platforms like Duolingo, Babbel, Busuu, and Lingoda have gained massive user bases by making language learning accessible and affordable. These platforms combine gamification with adaptive algorithms that adjust difficulty based on user

performance. They develop listening, reading, writing, and pronunciation skills through speech-recognition technology.

Some researchers argue that such platforms create rich environments that support authentic communication practice. From our perspective, this assessment is partially accurate but overly optimistic. While these platforms excel at vocabulary building, they often struggle with nuanced language use and cultural context. The gamified approach can reduce language learning to repetitive pattern matching rather than genuine communication. However, the accessibility factor cannot be ignored – these platforms have democratized language learning in ways traditional education never could (Carrier et al., 2017).

Videos, podcasts, and webinars allow learners to encounter authentic language use – real people speaking naturally with genuine accents and cultural references. Mauro-Jackson notes that multimedia ensures deeper immersion and strengthens long-term memory through combined visual and auditory input (Mauro-Jackson, 2020).

However, authenticity comes with challenges. Unstructured exposure to native-level content can overwhelm learners. The jump from simplified textbook dialogues to actual podcast conversations is substantial. Simply watching videos without structured support often leads to passive consumption rather than active learning.

Gamification elements – point systems, achievement badges, progress tracking – tap into fundamental human motivations. Kim *et al.* demonstrate that combining gamification with spaced repetition systems, as seen in Memrise and Anki, significantly improves vocabulary retention. (Kim et al., 2017).

From personal experience, I can confirm this effectiveness, though with important caveats. Spaced repetition algorithms excel at preventing the forgetting curve. However, this approach works best for discrete items – vocabulary words, verb conjugations – and less effectively for communicative competence. The motivation provided by gamification also shows diminishing returns over time.

Initial enthusiasm eventually gives way to routine, at which point intrinsic motivation becomes crucial.

Apps like Anki, Quizlet, LingQ, and Drops epitomize mobile learning's promise: continuous access regardless of location or time. Traxler and Crompton characterize mobile learning as the most flexible format, supporting consistent practice throughout daily life (Traxler, Crompton, 2018).

This flexibility represents both strength and weakness. While mobile apps enable practice during commutes or lunch breaks, this fragmented learning approach may not suit all aspects of language acquisition. Deep engagement with complex grammar often requires focused attention difficult to achieve in mobile contexts. Additionally, the convenience can create an illusion of progress – spending five minutes daily on a vocabulary app feels productive, but without complementary speaking practice and writing exercises, mobile learning alone cannot develop comprehensive proficiency (Traxler, Crompton, 2018)

VR and AR technologies represent the cutting edge of language learning innovation. VR can simulate realistic communicative situations – ordering food, checking into a hotel, navigating an airport – allowing learners to practice without real-world pressure. AR provides interactive dictionaries and 3D vocabulary models. Plaza *et al.* note that these technologies reduce speaking anxiety through experiential learning (Plaza et al., 2016).

Despite these benefits, practical limitations remain significant. VR equipment requires substantial investment, and quality language-learning VR applications remain scarce. For most learners, especially in developing countries or underfunded institutions, VR remains aspirational rather than practical (Plaza et al., 2016).

AI-powered tools offer real-time pronunciation correction, grammatical error detection, automated essay evaluation, and personalized curriculum generation. Carrier *et al.* emphasize that AI provides high-quality feedback while helping learners overcome psychological barriers (Carrier et al., 2017).

The potential is undeniable, yet current AI language tools reveal clear limitations. Pronunciation feedback systems sometimes struggle with non-standard accents. Automated essay evaluation cannot yet match human teachers in assessing argumentation quality or cultural appropriateness. Perhaps most importantly, AI lacks the cultural and contextual understanding that makes language truly communicative – a teacher can explain not just that something is incorrect, but why a phrase might be inappropriate in certain social contexts.

To improve English proficiency, a multifaceted approach is employed that combines several technologies while acknowledging their individual limitations. A structured schedule is maintained, alternating grammar exercises, reading materials, and listening practice. For vocabulary development, spaced repetition algorithms are used; notably, a daily Duolingo streak has been sustained for more than two years.

This sustained habit has proven valuable not primarily for what Duolingo teaches, but for what it maintains: daily contact with the language. Even on busy days, five minutes with the app keeps English present in my routine. However, I recognize this represents only one component. I supplement app-based practice with reading articles, watching videos, and seeking opportunities for written communication. The key insight is that no single technology suffices – effective digital language learning requires strategic combination of multiple tools.

Interactive platforms provide accessibility and structured learning but may oversimplify complex language use. Their value lies primarily in vocabulary building rather than communicative competence. Multimedia tools offer authentic language exposure but require pedagogical scaffolding. Unguided exposure often proves less effective than structured engagement. Gamification and spaced repetition successfully leverage psychological principles to enhance motivation and memory. However, these approaches work best for discrete learning items and show diminishing motivational returns over time. Mobile applications enable flexible learning but fragment attention and may create illusions of progress. They work best as supplements rather than primary learning methods. VR and AR technologies

demonstrate potential for immersive learning but remain inaccessible to most learners due to cost and limited content. AI-powered tools offer personalized feedback yet lack the cultural and contextual understanding essential for advanced language learning. The most effective approach combines multiple technologies within a pedagogically sound framework. Technology enhances foreign language learning not by replacing traditional methods but by extending their reach and providing new forms of practice. The challenge lies not in adopting the newest technology, but in thoughtfully integrating appropriate tools to support comprehensive language development.

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THE WORLD OF TOMORROW: ON THE VERGE BETWEEN SCIENTIFIC BREAKTHROUGH AND DANGER

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Every person has at least once thought about what the world of the future will be like. What awaits humanity in a hundred, two hundred, a thousand years? Will our lives become easier and happier thanks to science? Will progress present us with new challenges? My journey into the future is an attempt to imagine what our lives could be like if we continue to improve ourselves, learn about the world, and discover ourselves.

Since ancient times, people have sought to better understand the world around them. This knowledge has helped us overcome our inner fears, opened up new opportunities, and created more comfortable and safe living conditions. It has been the driving force behind the development of civilization.

Today, we cannot imagine our lives without electricity, light, the Internet, modern means of communication, and household appliances. Machines and conveyor belts, cars, planes, computers androbots, complex medical devices, and

much more are the result of the long journey of human thought. Once upon a time, these things existed only in the imagination of the boldest dreamers.

Humanity has taken a huge step forward thanks to curiosity, determination, creativity, and the power of dreams. Every discovery was made possible by people who looked into the future and worked toward it. Among them were many Ukrainians. Our people have given the world outstanding scientists and inventors. Their glorious names are Igor Sikorsky, who created the world's first multi-engine aircraft and helicopter and changed the development of aviation; Sergei Korolev, designer of spacecraft and creator of a new space age; Vladimir Vernadsky, who laid the foundations of modern science about the biosphere; Physicist Kirill Sinelnikov, who became one of the creators of the first nuclear fission in Europe (MacAlpine, 2024). Their ideas once seemed fantastic, but today they are part of reality.

And today, Ukrainian scientists and inventors are continuing the traditions of their predecessors with dignity. Startups in the fields of biotechnology, robotics, computer technology, and artificial intelligence are developing in Ukraine. Companies such as Grammarly, which created an intelligent assistant for checking English texts; Reface, which uses artificial intelligence technologies to edit images and videos; Petcube, which develops “smart” cameras for communicating with pets, have gained worldwide recognition. Companies such as Biosensorix, Esper Bionics, and Cardiomo are known far beyond the country's borders. They create “smart” biosensors, prostheses with artificial intelligence elements, and portable devices for monitoring health. Ukrainian specialists are among the most creative and are already actively building our future.

Science is developing at a rapid pace. The latest discoveries and inventions are changing the world, bringing us closer to a future that we once only read about in science fiction books or saw in movies.

Today, I also feel like a time traveler. I ask myself, what will our lives be like in 50, 100, 200 years? I close my eyes and mentally embark on a journey into the future.

Modern knowledge in the fields of genetics, nanotechnology, bioengineering, chemistry, and physics has opened up enormous opportunities for humanity.

Biotechnologists have learned to grow plants that are highly productive and resistant to pests and climate change. This has made it possible to turn deserts into green fields and blooming gardens in the future, and to use land for agriculture that was long considered unsuitable for this purpose (Global trends, 2021). Thanks to genetically modified crops, the use of chemicals has decreased and the shelf life of products has increased. Society has managed to ensure food security, eliminate hunger, and improve the environment.

In the future, knowledge gained in genetics will allow people to prevent the development of many diseases at an early stage and find cures for those ailments that are currently considered incurable. In a few decades, medicine will become not only therapeutic but also primarily preventive (Nawal, 2024). In the future, everyone will know their weaknesses and receive personalized advice on lifestyle, nutrition, and treatment.

The development of reproductive medicine in the future will bring the joy of parenthood to many families. Artificial insemination and genetic engineering technologies help to avoid hereditary diseases and ensure the birth of healthy people. Science allows us to control not only fertility, but also to improve the quality and duration of human life. Nanorobots repair cells from within, cleanse blood vessels, and destroy cancer cells quickly and without harm to the body. New technologies have slowed down aging and made human life longer and healthier.

But humanity has made its greatest breakthrough in the development of artificial intelligence, robotics, and digital technologies. Robots perform complex operations. They manage production, help at home, and become assistants in medical institutions, schools, and nursing homes. Robots patrol the streets of our cities and maintain order. In the future, most routine work will be transferred to robots and automated systems (Duggal, 2025). This will give people more time for creativity, science, art, and self-development. Artificial intelligence analyzes huge amounts of

information, makes decisions faster than humans, predicts disasters, and helps governments run countries.

Digital technologies open up new opportunities for education, culture, and communication (UnitedNations, 2020). Virtual and augmented reality allow people to travel consciously without leaving home, visit museums, study at the best universities in the world, and participate in international conferences. The education of the future is becoming more accessible, and culture is becoming more open. Thanks to the internet, humanity is becoming more united and tolerant.

All these achievements will pave the way for space exploration. People will be able to actively explore the distant universe. They will adapt their bodies to life on other planets. Thanks to new knowledge in biology, physics, and energy, it will be possible to create space stations with conditions as similar as possible to those on Earth (NASA, 2023). Travel to other worlds, which now seems like science fiction, may become part of everyday reality. And perhaps science, culture, and technology will unite for a harmonious future for humanity.

However, my imagination can also paint a different picture of humanity's future – a picture of destruction and self-destruction (ImpactDay, 2024). I imagine robots and automated systems gradually replacing humans in many professions. People are unable to adapt to such rapid changes. This leads to rising unemployment, social inequality, and the development of depression and mental illness. Gradually, the danger of excessive human dependence on technology increases, the ability to think independently and make decisions decreases, and motivation to learn disappears. Artificial intelligence increasingly controls people and manipulates public opinion. Excessive digitalization leads to the uncontrolled collection and accumulation of personal data of all people, destroying privacy. Artificial intelligence is gradually penetrating all spheres of human life and gaining complete control over each of us.

Another threat is the creation of autonomous weapons that can operate without human involvement, which raises questions about the morality of their use.

Humanity is gradually losing control over machines. And it is no longer machines that exist for humans, but humans who are created for machines.

The same can be said about genetic engineering. Interference in natural life processes can lead to unpredictable results. Changes in human or animal DNA can cause new genetic diseases or get out of control. There is also a danger of abuse -the creation of “perfect” children with predetermined physical characteristics, intelligence, or physical abilities. This will breed social inequality and discrimination. Many brilliant and talented scientists, poets, and artists may not be born simply because they do not meet certain criteria.

The use of genetically modified organisms could negatively affect ecosystems, destroy natural diversity, and harm human health. There is a risk of creating biological weapons as a global threat.

I open my eyes and ask myself: what will humanity choose? In my opinion, it is extremely important today that the development of science and technology be accompanied by strict control, compliance with ethical standards, and international agreements that will guarantee the safe use of these discoveries for the benefit of humanity.

We must not forget moral and ethical principles. Knowledge and technology must be combined with humanism, compassion, and responsibility. People must remain the core value of civilization, with science serving only as an aid. We must learn to use the achievements of progress responsibly, without allowing them to destroy nature, culture, or spirituality. Our choices, our consciousness, and our responsibility determine what the world will be like tomorrow – harmonious and just, or full of struggle, selfishness, and fear. The future is in our hands, and it is up to us to make it better.

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STUDENT SELF-GOVERNMENT AS A MEANS OF SELF-REALIZATION

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Choosing a specialty is always difficult, especially when you have many hobbies, or when you have none at all. Often, students choose their specialty based on their strongest side or inclination towards a certain field. However, once inside the university walls, many discover that their interests are much broader than their chosen profile. A future engineer might have a talent for public speaking, while a future philologist might suddenly discover a knack for project management. By

getting stuck focusing only on their core curriculum, most students don't see other options for self-realization and don't try their hand in new fields. Student self-government is an excellent option for those who want to try something different and, perhaps, find their alternative path.

In every university, there is a student self-government body, its main task is to protect students' rights and express their opinions at the university level (Law, 2014). But one should not forget that student self-governments also organize various events for students, which means that ideas, PR, and most importantly, organization with subsequent implementation are needed.

Let's start with the simple things: people who run the social media for student self-governments realize their potential as SMM managers. While being future engineers, they gain vast experience in managing social media, working with the public, and correctly presenting information that should capture the public's interest.

This year, our student self-government had the chance to implement a grant to hold a large event for students. Through this, firstly, we gained experience in writing grant proposals, which is currently in high demand in the labor market. With its further implementation, we also had to work on every detail of the future event, so students, mostly from technical specialties, tried on new roles.

Event organizers are the people who came up with the structure, schedule, invited speakers, and connected partners to this project. They gained invaluable experience in conducting business at an official level, signing agreements, and concluding memorandums. This also includes the experience of organizing an event – arranging speakers by topic, coordinating timings, and finding a venue for the event.

Of course, for an event to "live", it needs hosts–those without whom no event can go as planned. They gained incredible experience in communicating with an audience, holding its attention, speech delivery, and the opportunity to overcome stage fright and the effect of a crowd.

But for the hosts to work smoothly and for speakers to present, the flawless operation of the technical department is essential. A large event with a poor technical department is doomed, so people who engage in this type of activity are extremely in-demand in the labor market. During the project, students gained experience working with a large amount of equipment, its proper setup, the ability to solve complex situations in a short time, and rapid adaptability to emerging conditions (Astin, 1984).

During the event itself, hall administrators play a key role–people who watch everything happening through the eyes of a spectator and inform the organizers and all team members when something goes wrong. These are the very people who can react at any moment and understand how to prevent a problem before it becomes critical.

The SMM department works in parallel with everyone else. As already mentioned, SMM specialists are responsible for disseminating information on social networks. The information can be varied, from simple event advertising and announcing the start of registration to quick notifications about delays in any part of the event. Without them, the event won't start, and without them, it won't run as smoothly as one would like.

And finally, photographers. We all want to take some impressions away with us– emotions, acquaintances, information. But it's still nice to have something more tangible that will really help recall various moments and relive them. A large number of young people are fond of photography but lack sufficient experience and a working portfolio. This event helped young people realize their potential, gave them a chance to follow a path they enjoy, and to fill their portfolios not just with landscapes, but with lively photos of people in various situations. It is also worth noting that photographers working at events is an extremely in-demand job that people are willing to pay for.

It is important to note that in addition to "hard skills" (specific skills like sound setup or grant writing), every team member, regardless of their role, develops

universal "soft skills". This is, first and foremost, teamwork: the SMM department must work in conjunction with the organizers, and the tech crew with the hosts. It's time management, when the event is a week away and nothing is ready. It's responsibility, when you understand that the success of the entire big project depends on your small task (Kryshtanovych et al., 2020).

In conclusion, it can be said with certainty that even one successful project, done in a student self-government team, can help many people find an additional path for themselves that will be interesting to them. It helps to develop a hobby that brings pleasure and may, perhaps, grow into a future job. Student self-government is an excellent option for self-realization, the main thing is to find yourself in it.

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HOW IS THE GLOBALIZATION OF THE INTERNET DESTROYING THE FUTURE OF CULTURE?

Scientific Advisor – Senior Teacher Lysenkova T. M.

The Internet has become a driving force in the acceleration of globalization. The relationship between the Internet and globalization has been crucial in bridging

gaps across borders and cultures, offering new opportunities and challenges for economies and societies worldwide (Westford University College, 2022).

Web technology is changing how we work, helping us share knowledge globally, and bringing people closer together. Companies can easily share data across the world. We can send ideas and information to people far away and access the same resources. The internet makes it easy to connect with different cultures and communities (Westford University College, 2022).

With free access to the World Wide Web, people from different countries are becoming more and more alike: they listen to the same music, watch the same TV show and follow the same fashion trends from social media, which dictate how everyone should look in order to be considered stylish.

Cultural diversity is a wide concept, and can include diversity of language, national identities, traditions and religions. The relation between the Internet and cultural diversity, in its various forms, is two-fold (Digital Watch Observatory, n.d.).

On the one hand, people have access to all the information in the world, which allows them to develop comprehensively, without being limited to books in the local library. On the other hand, some may say that the Internet is increasingly killing people's individuality, making them similar to each other. Is globalization really a positive process in the cultural and educational context, or is it a threat to the existence of different cultures? Will we all be one big culture without our own traditions in 100 years?

First of all, why does this question even arise? Everyone knows that the Internet is available all over the world. If the Internet has users from different countries, both viewers and content creators, how can this negatively affect cultures? Why cannot people just consume content created by people of their own cultures and for their own cultures?

As statistics shows, approximately 56% of Internet content is English (Helmut Juskewycz, 2016). The Internet has been a predominantly English-language medium, which creates problems for cultural differences. That is, if people are interested in

some topic and need to find the information about it that is not available on the Internet in their languages, they will turn to English-language sources. And even if the information is available in other languages, it is usually not as high-quality and comprehensive as English-language content. Consequently, people adopt the experience of English speakers, mostly Americans, who significantly dominate the content creation market, and their content does not include the cultural characteristics of other countries and cultures. This may apply to the content about music and movies, fashion, etc., which further creates grounds for the unification and lack of diversity in everyday things. People tend to follow global trends rather than local ones, as they are often perceived as more modern and progressive.

In addition, even bloggers, musicians and other producers of any media content from other countries find it strategically much more profitable to produce it in English in order to reach a wide audience rather than limiting themselves to their own people.

In fact, the problem of globalization through the Internet goes far beyond the trends in pop culture. It can be said that music or movies in no way threaten cultural diversity, but only are a form of entertainment. However, if we look deeper, we can see that it is not that simple. Let's have a look at this on the example of well-known films.

Hollywood films are perceived by people around the world as the «ideal picture». Let's take classic Christmas movies as an example. Every year, people from different countries watch «Home Alone», «Miracle on 34th Street» and other classics. What is wrong with that? For example, the fact that they show Christmas celebrations in only one way - the American way. They do not show the diversity of the millennial traditions of different cultures, but only a large Christmas tree in the middle of the living room and the classic image of Santa Claus in a red suit, which, incidentally, was invented by the Coca-Cola Company just for its commercial not so long ago, only in the 1930s. But this image has already become familiar and beloved by children all over the world.

As a result, people, especially the younger generation who grew up on these Christmas films and had free access to them, want to celebrate holidays in their style instead of adhering to the traditions of their culture and families, because for them this has been a familiar and desirable picture since childhood. The same principle applies, for example, to fashion trends that don't use national motifs in clothing as a means of self-expression, and to music that sounds the same from performers throughout the world, and it is mostly in English.

The Internet is becoming increasingly important in our daily lives. Twenty years ago, people used push-button mobile phones, which at that time were already considered a breakthrough after landline ones, and computers were mostly used only in offices, but now such a scenario is hard to imagine. We are practically constantly online. Laptops are turned on in the morning and are not turned off until late at night, because they are used for studying, working and watching episodes of favourite TV shows, while smartphones constantly receive new notifications from social networks.

The use and the influence of the Internet is growing every year and becoming an addiction, which accordingly affects cultural aspects. We are becoming dependent on what trends dictate to us on TikTok and what strangers write to us in comments. In pursuit of acceptance and likes, influencers are becoming «universal», speak English and don't convey visible cultural characteristics in order to appeal to more people from around the world. When famous people demonstrate such behavior, it sets an example for others.

Considering how much globalization and the Internet in particular have changed people's lives over the past couple of decades, it is difficult to imagine how much more everything will change in the future. There is a great threat of destroying and forgetting the traditions and cultures of different peoples if these processes do not change their course.

Another question is how to combat these processes, and the first thought that comes to mind is that it is impossible. The Internet has reached such a level of

influence on globalization processes that there is no way to stop it. However, there are always ways.

Teenagers and young adults are the most vulnerable targets of such processes. More than any other age group, they strive to be trendy and spend a lot of time on social media consuming various content. But at the same time, this is an audience that is difficult to change at this stage. For them, this lifestyle is so normal that teaching them a completely different approach to life now may be pointless.

In turn, the easiest audience to teach is children. It is from childhood that love and respect for one's own traditions must be instilled so that it becomes fundamental for future generations. This includes producing content for the youngest children in different languages and for different cultural groups.

The next steps are definitely to create content for all age groups with different interests and needs. This includes music, movies, computer games, and everything else you can think of. Governments and cultural institutions should provide young artists with opportunities to develop and create locally oriented cultural products.

Despite all of the above, there are examples of demand for national cultural products in societies. For example, with the start of full-scale war in Ukraine, there was a strong wave of popularization of Ukrainian culture. There was a significant demand for Ukrainian music, films, blogs, etc. in the society, which led to a thriving in various creative industries online. For instance, Ukrainian songs began to top the music charts, partially replacing foreign ones.

This is an understandable reaction to the shock of what was happening in the country, which ultimately led to a growth in national identity. Still, in order to develop cultural identity in different countries in the future, society needs to figure out ways to promote national products without such terrible national events as war.

Even in Ukraine, after a few years, the wave of interest in Ukrainian culture is beginning to lose its force, as people became more selective in the content they consume. If at the beginning of the war it was enough, for example, for songs to be in Ukrainian to interest the average listeners, now this is no longer enough. They

want to see and hear what best suits their own interests and preferences, which is not always available. This also indicates a lack of high-quality cultural content and its incomplete coverage of various topics, so there is room for growth.

In conclusion, while the Internet has undoubtedly opened up the world to unprecedented levels of communication and knowledge sharing, it has also contributed to the erosion of cultural diversity. By prioritizing global trends and English-language content, it promotes cultural uniformity. The growing influence of global media, especially on young audiences, is gradually replacing national identity with a universal but superficial cultural standard.

Preserving cultural diversity in the digital age requires conscious efforts, including the creation of multilingual, culturally rooted content on a variety of topics and for different age groups, starting with children. Only through such purposeful action can humanity benefit from globalization without losing the richness and uniqueness of its many cultures.

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Kohut A. S.

SHAPING THE FUTURE OF UKRAINE

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The future has always aroused curiosity and anxiety in people at the same time. Each new era brings with it not only technological achievements, but also changes in culture and way of thinking. I would like to imagine a journey into the future using the example of Ukraine.

The future of science in Ukraine has a big potential to grow and can make an important contribution to the world of science. Ukrainian scientists are already working actively in areas that can have big breakthroughs in the future, such as biotechnology, nanotechnology, information technology, and space research. For example, Ukrainian engineers take part in international space projects, including making satellite platforms and exploring space. Biotechnology startups are creating new ways to treat serious diseases and develop new vaccines.

Information technology and artificial intelligence are also very important directions. Ukrainian IT companies are already known in the world for good programming, creating cybersecurity systems, and artificial intelligence. Young scientists are making projects to automate production, analyze big data, and improve city management systems.

The future of science in Ukraine is closely connected with education and international cooperation. Student exchange programs and joint research projects with universities in Europe and the USA help Ukrainian scientists share their discoveries with the world and use modern equipment. Investments in scientific startups and government programs for innovation create a chance to develop unique Ukrainian technologies that can affect the economy, medicine, and culture.

So, the future of science in Ukraine is not only about discoveries and technological breakthroughs. It is also about creating better conditions for society, improving the quality of life, and building a new scientific and cultural identity for

the country. Ukraine has all the resources to become a center of innovation and to make its contribution to the future of global science.

The future culture of Ukraine promises to be bright, diverse, and connected with modern technologies. Ukrainian artists are already experimenting with new ways to show their ideas, combining traditional motives with digital technologies. For example, musicians use virtual reality and digital tools to create interactive concerts, and artists make digital galleries and NFT art, which helps show Ukrainian culture to people all over the world.

Cinema and theater are also developing in new directions. Independent Ukrainian directors often mix documentary and fiction forms, exploring social problems and the cultural values of the country. Online platforms allow people from different parts of the world to see Ukrainian art, which helps promote national culture and create international collaborations.

Literature and popular media are also changing. Young Ukrainian writers use digital platforms to publish their works, and podcasts and video blogs help share cultural and educational materials in an easy and interactive way. Cultural festivals, like “GogolFest” or “Book Arsenal”, are not only places for artists to meet but also laboratories for new cultural ideas and technologies.

So, the future culture of Ukraine will mix traditions and innovations, local values and global trends. It is a culture that keeps its uniqueness, but at the same time opens new ways for creativity, communication, and cultural influence in the world.

The future technologies in Ukraine promise to change the way people live, the economy, and society. Ukrainian startups and research centers are actively developing innovations in artificial intelligence, robotics, energy, and digital infrastructure. For example, Ukrainian companies are working on self-driving transport systems, drones for farming, and smart platforms to analyze big data, which help make production more effective and improve city planning.

In the energy field, Ukraine is actively exploring renewable energy sources, like solar and wind power, and also using smart grids, which help save energy and

reduce costs. In medicine, technologies allow the creation of telemedicine platforms, robotic surgery systems, and personalized treatments based on big data and artificial intelligence.

Digital technologies and software also change the way people communicate, learn, and work. Online platforms, cloud services, and tools for remote learning make education easier to access; and robotics and automation give new opportunities for industry and business.

Ukrainian programmers and engineers are already known in the world for their work in cybersecurity, artificial intelligence, and software development for international companies.

So, the future technologies in Ukraine combine innovations, scientific achievements, and practical solutions for society. They open new ways for the development of the economy, education, health care, and infrastructure, while also shaping the modern face of the country and its place in the global technology world.

Of course, it is very hard to predict the future during war and uncertainty, and no one can know exactly what it will be. But I would like Ukraine in the future to be a strong, creative, and open country, where people have chances to grow and achieve their goals. Our country should use science, culture, and technology in ways that help everyone, support creativity and education, develop the economy, and at the same time keep humanity and moral values.

Only then will the future be a place where we really want to go, and where every person can feel part of a big, creative, and innovative community. Ukraine has all the resources, talent, and potential to become a country that not only keeps up with the times but also builds its own unique future, influencing science, culture, and technology in the world.

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FROM PROGRESS TO PRACTICE: SOCIAL IMPLICATIONS OF EMERGING TECHNOLOGIES

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The future is full of possibilities, challenges, and uncertainties. Many factors influence the appearance of the world, including culture, society, technology, science, and the environment. All these elements are interconnected, and a change in

one area can produce unexpected effects in another. Reflection on future developments demonstrates how rapidly the modern world is transforming, creating both new opportunities and serious challenges as technological progress moves into practical application.

Artificial intelligence represents one of the most significant technological developments of the contemporary era. AI systems are becoming more powerful each year and already influence almost every industry. They increase efficiency, accelerate work processes, and enable the solution of complex problems that were previously unattainable. At the same time, large-scale automation may lead to job displacement, generating economic and social difficulties for many individuals. Such changes may intensify social inequality, particularly among populations with limited access to resources. If artificial intelligence is not implemented responsibly, the gap between different social groups may widen, highlighting the need for ethical regulation and socially oriented technological policy.

Environmental change is another critical factor shaping the future. Human activity has caused substantial damage to natural systems, and its consequences are becoming increasingly visible. Rising global temperatures, drying rivers, and more frequent storms, floods, and heatwaves are already altering patterns of human settlement and economic activity. These effects are especially severe in regions that are poorly prepared for natural disasters, placing millions of people at risk. Without adequate environmental protection measures, ecological instability will continue to affect societies worldwide.

Water scarcity clearly illustrates the social consequences of climate change. Melting glaciers, shrinking freshwater reserves, and rising temperatures signal an increasing risk of water shortages. Addressing this issue requires innovative approaches to water management and sustainable consumption. Scientific progress must be translated into practical solutions that ensure equitable access to water resources and long-term environmental stability.

Fossil fuel resources are finite, and oil and gas reserves may be depleted within the next few decades. This situation necessitates a transition to alternative energy sources such as solar, wind, and nuclear power. Transportation systems are already shifting towards electric power and alternative fuels, including hydrogen. Although this transition may be challenging for economically disadvantaged regions, technological development can support adaptation and reduce negative social impacts. The transformation of energy and transport systems represents both a technological challenge and an opportunity for sustainable development.

Transportation is expected to undergo profound changes. Electric vehicles are becoming increasingly common, and future developments may include flying vehicles designed for short-distance travel. Infrastructure, traffic systems, and public transport will differ significantly from current models. Cultural factors will influence the speed and manner in which new technologies are adopted, as social habits and values shape technological acceptance. Smart cities equipped with intelligent traffic systems will allow vehicles to communicate with one another, reducing congestion, pollution, and accident rates.

Medical science will also benefit from emerging technologies. Advances in diagnostic tools and treatment methods will make healthcare more efficient, accessible, and cost-effective. These improvements will enhance the quality of life for millions of people. The interaction between scientific innovation and society is particularly evident in healthcare, as medical progress directly influences demographic trends, life expectancy, and social planning.

Cultural patterns and human relationships will continue to evolve under the influence of technological change. Social interactions may become more individualised, and traditional models of family and partnership may transform. While technology shapes communication methods and social behaviour, cultural norms ultimately determine how these changes are interpreted and integrated into everyday life.

At the same time, global communication technologies facilitate unprecedented cultural exchange. Rapid access to information enables greater awareness of different traditions and lifestyles. Although this process may contribute to cultural homogenisation, it also provides opportunities to preserve and promote cultural diversity. Artistic expression, including art, music, and literature, is likely to develop through a combination of traditional forms and technological innovation.

International mobility is also expected to increase. While political borders may remain, travel, education, and employment across countries are becoming more accessible. This growing mobility encourages international cooperation, knowledge exchange, and cultural interaction, strengthening global social networks.

Education systems are undergoing significant transformation as well. Digital technologies enable more interactive and practice-oriented learning environments. Virtual reality, simulation tools, and digital platforms allow students to acquire practical skills in a safe and controlled setting. The integration of science, technology, and culture into education enhances its relevance and prepares individuals for real-world challenges.

Despite rapid technological progress, certain fundamental human needs remain unchanged. Societies will continue to require transportation, energy, and communication. Language, traditions, and creativity will remain essential elements shaping technological development. Technology both reflects cultural values and contributes to their transformation. For example, vehicles are not merely technical objects but social artefacts that reflect collective preferences, habits, and priorities.

Looking towards the future, technological advancement promises increased efficiency and convenience, but also raises ethical concerns. Autonomous systems, renewable energy technologies, and artificial intelligence will become more widespread, while questions of responsibility, environmental sustainability, and social justice grow increasingly important. These ethical considerations are inseparable from technological innovation.

The future will largely depend on human decision-making, adaptability, and creativity. Although it is impossible to predict all outcomes, societies can prepare by promoting education, ethical awareness, and responsible technological use. Science, culture, and technology are deeply interconnected, and choices made today will shape future social structures. Progress is not defined solely by innovation but also by how technologies are integrated into human life and culture.

In conclusion, the future will be characterised by significant transformations in science, technology, and culture. While many developments promise substantial benefits, others pose serious social and environmental challenges. Although complete control over these processes is impossible, collective effort and responsible governance can contribute to a more sustainable and equitable future.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN EDUCATION

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The integration of Artificial Intelligence (AI) into the modern educational landscape represents a paradigm shift, moving away from standardized, teacher-centric models toward highly personalized, data-driven learning experiences. This technological revolution is reshaping not only the methodology of instruction but also the fundamental understanding of how knowledge is acquired and assessed. AI promises to address long-standing challenges in education, primarily by providing scalable solutions for individualized instruction and administrative efficiency. However, its implementation is fraught with ethical dilemmas concerning data privacy, algorithmic bias, and academic integrity.

One of the most compelling applications of AI lies in its ability to offer adaptive learning systems. These platforms use sophisticated algorithms to continuously assess a student's cognitive state and progress, tailoring content, pace, and difficulty in real-time. This differs fundamentally from traditional differentiated instruction, which relies heavily on the teacher's subjective assessment and time constraints. For instance, an AI tutor can instantly identify a specific conceptual gap in algebra and provide targeted exercises, something a single human instructor overseeing thirty students cannot feasibly accomplish.

The result is a more efficient use of learning time and a higher likelihood of concept mastery, especially in foundational subjects. Furthermore, AI tools can significantly reduce the administrative burden on educators. Tasks such as grading tests, checking homework, and organizing schedules can be automated. This allows teachers to focus more on the creative and interpersonal aspects of teaching, such as mentoring and fostering critical thinking skills. For example, automated grading systems are already widely used in massive open online courses (MOOCs), enabling thousands of students to receive immediate feedback. Furthermore, predictive

analytics driven by AI models can identify students at risk of dropout or academic failure long before human intervention might occur. These early warning systems allow institutions to deploy resources proactively, improving retention rates and providing timely support. The systematic streamlining of these processes allows schools to operate with greater efficiency, allocating human capital where it has the maximum impact.

Despite these technological advantages, the rapid deployment of AI in classrooms presents significant ethical and practical hurdles. The reliance on sophisticated algorithms to manage student data raises serious privacy concerns, requiring robust ethical frameworks and transparent data governance protocols. Furthermore, the introduction of algorithms carries the risk of embedding and amplifying existing societal biases. If an AI learning platform is trained predominantly on data from a specific socioeconomic or racial group, its adaptive recommendations may inadvertently disadvantage students from underrepresented backgrounds, thereby widening the existing educational gap rather than narrowing it.

The challenge to academic integrity is perhaps the most immediate concern. The rise of sophisticated large language models (LLMs) allows students to generate coherent, original-sounding essays and solutions with minimal effort, fundamentally disrupting traditional assessment methods. While AI-powered tools are emerging to detect AI-generated content, the ongoing technological arms race suggests that assessment methodologies must evolve rapidly. Educational institutions must shift their focus from evaluating simple content recall to assessing complex cognitive skills, requiring human synthesis, critical debate, and originality that current AI models cannot replicate reliably.

The transformative potential of AI in education is undeniable, offering powerful tools for personalization and administrative relief. AI-powered systems provide unprecedented opportunities to tailor learning experiences, ensuring that instruction aligns perfectly with individual student needs. However, the successful

and ethical integration of these technologies requires careful navigation of the challenges related to bias, data security, and academic honesty. The future of learning depends on creating a synergy between AI's computational power and the unique pedagogical insight of human educators, using technology not as a replacement, but as an indispensable partner in fostering the next generation of critical thinkers. The ongoing discourse must prioritize the development of AI tools that are transparent, equitable, and ultimately serve to augment, rather than undermine, the core human values of education.

The shift toward AI-enhanced education also necessitates a fundamental re-evaluation of the educator's role. Teachers can no longer serve solely as transmitters of standardized knowledge; their function must evolve into that of a mentor, facilitator, and coach. As AI assumes responsibility for routine tasks such as grading and content delivery, the human teacher's value lies increasingly in cultivating uniquely human skills: critical thinking, emotional intelligence, collaborative ability, and creative problem-solving. This evolution demands new forms of professional development to ensure educators are prepared not only to use AI tools effectively but also to teach students how to interact critically and ethically with them

AI holds immense potential to democratize access to high-quality education on a global scale. AI-powered translation tools can instantly convert lesson plans, textbooks, and lectures across diverse languages, effectively dismantling the linguistic barriers that have historically prevented access to international educational resources. This capability is crucial for promoting educational equity, especially in contexts of migration, refugee resettlement, and remote learning in developing nations. By making educational content universally comprehensible, AI facilitates a genuine global exchange of knowledge, allowing learners from diverse cultural backgrounds to participate equally in the worldwide academic community. This globalization of learning reinforces the need for curricula that prioritize cultural competency and adaptability, preparing students for an interconnected future.

In conclusion, the integration of AI into education is not merely a technical upgrade but a fundamental reimagining of the entire learning ecosystem. Its power to personalize instruction, automate administrative tasks, and globalize access presents an unprecedented opportunity to create more effective and equitable educational systems. However, this promise is contingent upon our vigilance in addressing the significant ethical pitfalls of data privacy, algorithmic bias, and academic integrity. The path forward does not lie in choosing between human educators and artificial intelligence, but in forging a synergistic partnership. By leveraging AI's computational prowess to handle scalable tasks and data analysis, we can liberate human teachers to focus on what they do best: inspiring curiosity, nurturing empathy, and guiding students in developing the critical, creative, and ethical capacities that define our humanity. Therefore, the ultimate goal is not to create AI-powered education systems, but to build wisdom-driven systems, empowered by AI, that prepare every learner to thrive in a complex and rapidly evolving world.

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THE FUTURE IS CREATED BY THE CHOICES WE MAKE TODAY

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The future has always fascinated humanity, because no one knows what it will really be like, and there is no way to verify it. Each generation imagines what lies ahead – flying cars, life on other planets, or machines that think like humans. Today, as we stand on the threshold of a new era, science, culture, and technology are converging in ways that redefine the very concept of human existence. There are more and more questions. A journey into the future is not just a story about inventions or progress. It is a story about how we will live, think, and communicate with each other in a rapidly changing world.

These three components need to be examined in detail, and let's start with science. Science is such an unusual part of our lives that it is sometimes difficult to find explanations for various phenomena. It is like a compass that shows our society the way forward. In the coming decades, we can expect breakthroughs that were previously only possible in our imagination or in science fiction films. For example, a quiet revolution is taking place in medicine. Gene editing tools allow scientists to modify DNA, which could potentially lead to the eradication of hereditary diseases and even slow down the aging process. And people are not afraid to experiment – they trust scientists and their inventions. Personalized medicine, where treatment is tailored to each person's genetic makeup, may soon become the global standard. People often talk about a “cure-all pill”. What if it really does exist soon? There are still many diseases and deaths from them in the world. But 100 years ago, there were even more. Medicine does not stand still and has no right to stop.

Medicine is more or less understandable because it is accessible to humans and has logical explanations. But what about space? Space exploration is no longer the dream of a few astronauts, but a joint project of humanity. Private companies are preparing missions to Mars, and telescopes are searching for planets where life could exist. Recently, there was a popular trend of sending your name to Mars. What if, in

the future, permanent human settlements appear outside Earth, turning interplanetary travel into a new page in human history? But there is also bad news, because it is unknown what this could mean for humanity. Science teaches us to look inward – to protect our planet, which remains our most fragile home. Climate science and renewable energy technologies are important tools for survival, helping humanity restore balance with nature. This balance must be maintained, and we must constantly think not only about innovation and discovery, but also about the safety of humanity. What if someone destroys our entire planet with a single action? Therefore, dreams of scientific development are not just pleasant fantasies, but in fact a rather difficult topic.

It's time to talk about technology. It's like the successor to science, because science discovers, and technology uses. An interesting and at the same time frightening assumption is that over the next century, technology will change not only what we do, but who we are. Artificial intelligence (AI) already writes poetry, drives cars, and helps doctors make diagnoses. The endless debate continues – is this good or bad? In the future, AI may become an everyday companion, capable of understanding emotions and helping people make difficult decisions. However, this raises profound ethical questions: Will machines replace human workers? Can AI be truly creative or compassionate? Will humans even be needed? My opinion on this is quite categorical, because we cannot be 100% sure that AI will be able to stop in time. What about the people working on it? This topic is quite sensitive, and one can endlessly debate the advantages and disadvantages of technology, but for now, we are seeing very rapid progress. For example, it may not be so noticeable in science, but it is very noticeable in technology.

Our cities are also undergoing change. The concept of “smart cities,” based on the Internet of Things, promises cleaner, safer, and more efficient urban living. Autonomous vehicles can reduce traffic accidents, and smart buildings will adapt to our needs and save energy. And what if virtual reality changes education, giving students the opportunity to explore ancient civilizations or conduct experiments in

digital laboratories? The boundary between the physical and digital worlds will disappear, creating a hybrid space where people can meet, learn, and create together, even if they live thousands of miles apart. It sounds like something out of science fiction, but in my opinion, it may be closer than we think.

No matter how advanced technology becomes, culture remains the soul of humanity. And for me, this is the most interesting topic. The future of culture will be determined by how we balance innovation and identity. Globalization and the internet have already connected billions of people, creating a shared digital culture (thanks to science and technology, by the way, which is further proof of how they are connected). Culture is a very important part of a country, and we must also be careful with it. In the future, the preservation of culture may depend on digital archives, virtual museums, and artificial intelligence tools that can translate and revive endangered languages.

Art and creativity are also evolving. And there are already noticeable breakthroughs in this area. Musicians will be able to compose songs using algorithms; artists will use neural networks to create images; writers will collaborate with artificial intelligence to explore new forms of storytelling. This combination of human imagination and machine capabilities is giving rise to a new kind of art that challenges our definition of authorship and originality. And this also raises the question: is it safe? In my opinion, this is a complex issue that will remain controversial for a long time. In culture, it is extremely important to preserve the soul and identity, because this is what defines us as human beings. However, the essence of culture lies not in the technology itself, but in the values we express through it. It is important that ethics, empathy, and creativity remain unique human qualities that no machine can truly replicate. Then there will be incredible results without danger.

The philosophical questions of the future will concern not what we can do, but what we must do. What if biotechnology allows people to improve their bodies and even their minds? This is already gaining momentum, as people already have the ability to change their appearance. However, it is society that must decide what it

means to be human. Will we accept the idea of merging human biology with machines, or will we decide to stay closer to our natural state? These cultural and moral debates will determine the direction of our species' development just as much as any scientific discoveries. Here, too, it is crucial not to succumb to the new, but to remain level-headed, because every action we take leads to something. That is a fact.

The journey into the future is full of promise, but it also carries risks. The future is not a distant dream; it is created every moment by the choices we make today. Science gives us the knowledge to explore, technology provides the tools to build, and culture reminds us of who we are. Our journey into the future will only be successful if we move forward not as isolated individuals, but as a single human family that values creativity, empathy, and responsibility. The greatest discovery of the future may not be a new planet or a new machine, but a new understanding of ourselves.

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THE ART OF BUSINESS COMMUNICATION

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In today's business environment, effective communication is a critical skill that underpins successful operations, decision-making, and relationship-building within and across organizations. As businesses increasingly rely on collaboration, both internally and externally, the ability to communicate clearly and persuasively has never been more important. This article will explore the various types of business communication, their key elements, and the essential role communication plays in achieving organizational goals.

Business communication refers to the exchange of information, ideas, and messages within and between organizations to achieve corporate objectives. It involves individuals at all levels of the organizational structure and is carried out through a variety of communication forms. Effective business communication requires clarity, accuracy, active listening, and the ability to adjust communication style according to different audiences and circumstances.

There are several distinct types of communication used in business settings, each serving different purposes and requiring different approaches. The most common types are:

- Verbal Communication: encompasses face-to-face meetings, phone calls, presentations, negotiations, and brainstorming sessions. Advantages: Immediate feedback, emotional expression, and suitability for complex topics and persuasion. Disadvantages: Spontaneity can lead to miscommunication, emotions may override logic, and verbal exchanges are often not documented.
- Written Communication: includes emails, reports, contracts, proposals, business letters, policy documents, and corporate chats. Advantages: Structured, clear, and easily archived. It also allows for controlled tone and clarity. Disadvantages: Slower feedback, potential for tone misinterpretation, and reliance on writing skills.
- Non-Verbal Communication: involves body language, eye contact, gestures, voice tone, posture, and facial expressions. Non-verbal cues are often more influential than words, particularly in building trust. In business settings, many decisions are based on how a person "feels" in terms of reliability.
- Visual Communication: includes charts, diagrams, infographics, slides, and user interface (UI) elements. Advantages: Simplifies complex data and decision-making processes. In today’s fast-paced business environment, visuals are key to quick comprehension. Disadvantages: Can oversimplify information and may not be suitable for all types of content.

- Digital Communication: this category covers all communication facilitated by digital platforms such as Zoom, Microsoft Teams, Slack, LinkedIn, CRM systems, and asynchronous video messages. Advantages: Eliminates geographical barriers, enhances accessibility. Disadvantages: Increased risk of misunderstanding due to the lack of emotional context and brief, often ambiguous messaging.

Effective communication is a dynamic process that involves several essential components. Each element plays a critical role in ensuring the message is received and understood as intended. These components include:

- Sender. The sender is the individual or group who initiates communication. The sender must formulate the message clearly and appropriately for the audience. For instance, a speaker must tailor their message for the audience to ensure it resonates.
- Message. The message is the information, idea, or feeling that the sender wishes to convey. It can take the form of words, gestures, or even body language. Effective communication requires the receiver to actively engage with the message.
- Encoding. Encoding is the process by which the sender translates their thoughts into a message, choosing appropriate words, tone, and non-verbal cues to ensure clarity. The success of this step often determines how well the message is understood.
- Channel. The channel refers to the medium through which the message is transmitted—whether it is face-to-face conversation, a phone call, an email, or social media.
- Receiver. The receiver is the individual or group who receives the message. Their role is crucial as their understanding of the message directly influences the outcome of the communication process.
- Decoding. Decoding is the process through which the receiver interprets the message. This step requires the receiver to accurately understand the sender's

words, tone, and non-verbal cues, often influenced by their own context and background.

- Feedback. Feedback is the receiver's response to the sender's message. It can be verbal or non-verbal and indicates whether the message has been understood correctly. Feedback allows the sender to adjust and refine their communication.
- Context. Context includes the environment in which communication takes place, such as the physical location, cultural background, and situational factors. Understanding the context helps both the sender and receiver interpret the message more accurately.
- Noise. Noise refers to any interference that disrupts the communication process. It can be physical (e.g., background noise), psychological (e.g., stress or bias), or semantic (e.g., confusion over language or terms).

Effective business communication is more than just mastering grammar and vocabulary; it involves emotional intelligence, cultural awareness, and the ability to adapt to different situations. Successful communicators not only select the right words but also consider the right timing, tone, form, and medium for their message. In this sense, business communication can be seen as an art—a dynamic process that requires intuition and precision. Key elements of this art include:

- Empathy: Understanding the perspectives and emotions of others.
- Goal-Oriented Communication: Ensuring that messages are aligned with business objectives.
- Situational Intelligence: Adjusting communication based on the context and audience.
- Cultural Awareness: Recognizing and respecting cultural differences in communication styles.
- Emotional Regulation: Managing emotions to maintain professionalism and clarity.
- Design Thinking: Structuring information effectively to engage and inform the audience.

In conclusion, the role of communication in business is both foundational and multifaceted. Effective communication is the backbone of successful organizations, facilitating the flow of information, decision-making, and relationship-building. Whether through formal channels such as reports and presentations or informal methods like team collaboration, each type of communication plays a vital role. By mastering these various forms and understanding the elements of the communication process, businesses can reduce obstacles, foster cooperation, and build a culture of open and effective communication.

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THE WAR FOR TALENTS IN THE GLOBAL ECONOMY: ECONOMIC AND SOCIAL CONSEQUENCES

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For the last twenty years, people have often said there is a «war for talent» in the global economy. This idea is not only a nice phrase, as contemporary research on talent retention and management confirms (Mohamad Mazlan & Jambulingam,

2023; Lin & Wang, 2022). It means that countries, companies, and other organizations are fighting to find and keep the best-skilled workers. Technology is advancing rapidly, and labor markets are now more connected than ever, so talented people are the main drivers of innovation, higher productivity, and stronger economic results (Shi et al., 2022). Because of that, this fight for experts has big and long-term effects on both the economy and society. If governments, businesses, and communities want real and stable development, they must understand these changes and react to them in time.

From an economic point of view, this «war for talent» has changed global competition in a very serious way. Countries that have good education systems, a high quality of life, and clear labor rules usually attract more skilled workers than others. These places become «talent magnets» and get many benefits: more innovation, faster economic growth, and better stability during crises. Empirical studies, such as the one conducted in China, show that cities winning the talent war demonstrate significantly higher levels of urban innovation (Shi et al., 2022). Because they can bring in experts from other countries, they develop modern industries like AI, biotechnology, and financial technology much faster.

On the other hand, countries that cannot keep or attract skilled workers face a problem called «brain drain». Because of this, their technology develops more slowly, and many industries become weak. This growing difference in talent levels makes global economic inequality even worse.

On the company level, the search for talent has changed how businesses plan and manage their strategies. Many companies now understand that people are their most important resource. Just paying a high salary is not enough anymore. Employers also need to create a real positive work culture, give chances to learn new skills (Asri et al., 2021), and allow flexible work conditions (Weng et al., 2023). Because of this, hiring strategies are now more personal and based on data. Companies use tools like predictive analytics, strong employer branding, and global online platforms to find workers. The businesses that attract the best people get big advantages: they work

more productively, create new ideas faster, and take leading positions on the market. Research confirms that effective talent management strategies, often mediated by retention efforts, are crucial for building a sustainable and high-performing workforce (Jindal & Shaikh, 2021; Asri et al., 2021). But there is also a negative side. Smaller companies, which do not have enough money, often cannot compete with big global firms, facing significant challenges in talent retention (Mohamad Mazlan & Jambulingam, 2023). This may lead to markets being controlled by only a few large companies, with less space for small businesses and new ideas.

Education is also affected. Universities and vocational schools introduce international programs, teach digital skills, and encourage lifelong learning. But focusing only on «job-ready» skills can shift education away from broader goals and is costly, increasing the gap between those who can afford learning and those who cannot.

The social effects of the global talent war are also very important. One big result is that more skilled workers are moving from country to country. They go abroad to find better jobs, a higher quality of life, and workplaces where they feel respected and included. This movement has good sides: it helps cultural exchange, builds global professional connections, and makes the world more linked. But at the same time, it can also create social tension.

Countries that receive skilled workers face hard problems in helping them fit in. Countries that lose workers often have fewer people, lose important skills, and see public services like healthcare and schools get weaker.

Inside countries, the fight for talent can hurt social unity. Companies focus on highly skilled workers, so the wage difference between them and less-skilled workers gets bigger. This increases economic gaps and social tension, especially in places that already have inequality. Also, praising only highly skilled jobs can make important but less valued roles, such as caregivers and service workers, feel ignored, worsening social divisions. On top of that, young people feel strong pressure to get very competitive qualifications, which leads to more stress, burnout, and mental

health problems. Studies highlight that a sustainable talent strategy must consider employees' well-being and work-life balance to mitigate these negative effects and foster a genuine intention to stay with an organization (Weng et al., 2023).

Views on work and success are changing: achievement is now measured by productivity, innovation, and skills. This supports meritocracy but can create unrealistic expectations and reinforce inequality, as privileged people have better access to education and networks.

Even with these big problems, the talent war also brings chances for real change. Governments can invest in education that includes everyone, make social support stronger, and create rules that help both local talent and international cooperation. Companies can hire fairly, really support diversity and inclusion, and care about workers' well-being, which are key factors for talent retention in the new era (Lin & Wang, 2022; Weng et al., 2023). International organizations can help by making fair programs for moving workers between countries and reducing the obstacles that stop developing countries from joining the global knowledge economy.

In conclusion, the global war for talent is clearly a main feature of today's economy. It strongly changes how economies work, how companies plan, and how societies live. While it fosters innovation and competition, it also causes inequality, population problems, and cultural tensions. Going forward needs a balanced approach, one that combines economic incentives with care for social responsibility. Only by working together fairly and responsibly can societies make the most of talented people around the world without making existing global problems worse.

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DIGITAL CITIZENSHIP AND CIVIC ENGAGEMENT: REDEFINING PARTICIPATION IN THE AGE OF PLATFORM GOVERNANCE

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The rise of digital platforms has transformed the nature of civic engagement, prompting a reevaluation of what it means to be a citizen in the 21st century. This article explores the concept of digital citizenship as a multidimensional practice encompassing political participation, media literacy, and ethical behavior online.

Drawing on recent studies in sociology, political science, and communication theory, it examines how platform governance, algorithmic visibility, and digital activism shape civic behavior across different regions. Case studies from Ukraine, Brazil, and the European Union illustrate the tensions between empowerment and surveillance, participation and polarization. The article concludes by proposing a framework for inclusive, critical, and rights-based digital citizenship.

In the digital age, citizenship is no longer confined to physical borders or traditional institutions. Social media platforms, online forums, and algorithmically curated news feeds have become central arenas for political expression, public debate, and collective action. This shift has given rise to the concept of digital citizenship, which encompasses not only access to digital technologies but also the capacity to engage ethically, critically, and actively in digital public life.

Digital citizenship is inherently multidimensional. It involves media literacy, online safety, participation in democratic processes, and respect for digital rights. It also requires navigating the complexities of platform governance, where private corporations set the rules for public discourse. In this context, civic engagement is shaped by algorithms, data policies, and content moderation systems that often lack transparency and accountability.

This article investigates how digital citizenship is practiced and contested across different sociopolitical contexts. It draws on interdisciplinary research to analyze the opportunities and challenges of civic engagement in digital spaces, focusing on how individuals and communities mobilize, resist, and reimagine participation under platform governance.

The study employs a comparative, qualitative methodology, analyzing three case studies:

- Ukraine’s digital mobilization during wartime: Examining how citizens use Telegram, Twitter, and civic tech platforms to coordinate aid, share information, and counter disinformation.

- Brazil’s youth-led digital activism: Investigating how marginalized communities engage in online campaigns for racial justice, environmental protection, and political accountability.

- European Union’s digital rights initiatives: Assessing policy frameworks such as the Digital Services Act and GDPR in promoting ethical platform governance and user empowerment.

Data sources include academic literature, platform analytics, policy documents, and interviews with activists and civic tech developers. The analysis focuses on:

- Forms of participation: Voting, campaigning, protesting, and community-building online.

- Barriers to engagement: Digital divides, algorithmic bias, and content moderation.

- Institutional responses: Legal frameworks, educational programs, and civic tech innovation.

Digital citizenship is not a static status but a dynamic civic practice. In Ukraine, digital platforms have become lifelines for civil society, enabling real-time coordination of humanitarian aid and resistance narratives. Citizens engage in distributed activism, often bypassing traditional media and institutions.

In Brazil, youth-led movements use Instagram, TikTok, and YouTube to amplify voices excluded from mainstream politics. These platforms serve as counter-publics, where cultural expression and political critique intersect. However, activists also face algorithmic suppression, harassment, and misinformation campaigns that undermine their efforts.

The EU’s regulatory approach emphasizes rights-based digital citizenship, focusing on transparency, data protection, and platform accountability. Initiatives like the Digital Services Act aim to balance freedom of expression with safeguards against harmful content. Yet, implementation remains uneven, and civil society continues to push for stronger enforcement and user participation in governance.

Across these contexts, digital citizenship emerges as a negotiated practice, shaped by technological affordances, sociopolitical conditions, and individual agency. It requires not only technical skills but also critical awareness, ethical judgment, and collective solidarity.

Digital citizenship redefines civic engagement for the digital era. It expands the boundaries of participation, enabling new forms of activism, dialogue, and community-building. Yet, it also introduces new risks – surveillance, exclusion, and polarization – that must be addressed through inclusive, rights-based frameworks.

To foster meaningful digital citizenship, governments, educators, and platform designers must collaborate to promote media literacy, digital ethics, and participatory governance. Civic tech initiatives, public policy, and grassroots movements all play a role in shaping digital spaces that are equitable, transparent, and empowering.

Ultimately, digital citizenship is not just about being online – it is about being accountable, informed, and engaged in shaping the digital public sphere. As platforms continue to mediate civic life, the challenge is to ensure that digital participation remains a force for democratic renewal rather than fragmentation.

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HUMANITY IN A WORLD OF MACHINES: HOW SCIENCE AND TECHNOLOGY SHAPE CULTURE

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Introduction

In today's rapidly changing world, the relationship between science, technology, and culture has become more dynamic and complex than ever before. Every new innovation – from artificial intelligence to virtual reality – reshapes how people communicate, create, and understand themselves. What once seemed futuristic is now an everyday reality: smart devices anticipate our needs, digital platforms connect billions, and algorithms influence our tastes and opinions (van Dijck, 2013).

As a student of Creative Industries Management and a professional working in social media marketing, I constantly observe how technological innovation changes not only the way we consume content but also the very essence of creativity. Each new app, tool, or digital trend becomes a catalyst for cultural transformation.

However, the speed of progress raises important questions: Will humanity manage to preserve its emotional depth and cultural roots in a world driven by machines? Can we maintain authenticity while embracing automation? The future of humanity depends on our ability to balance technological efficiency with cultural meaning and human values.

This essay explores how scientific and technological progress will shape culture, creativity, and communication in the coming decades – and how

professionals in the creative industries can adapt, lead, and humanize this transformation (Westford, 2022).

1. The power of science and technology

Science and technology form the backbone of modern civilization. Science provides understanding – it helps us discover the laws of nature and the universe – while technology transforms this knowledge into tools that improve our lives. Together, they drive every form of human progress, from medicine and transportation to art and entertainment

In the creative industries, technology acts as an amplifier of imagination. Visual effects in films, 3D modeling in design, AI-generated music, and immersive experiences in virtual museums all show how science expands the boundaries of artistic expression. What once required weeks of manual work can now be done in hours using software and automation.

In my professional experience as an SMM manager in the food industry, I have witnessed firsthand how technology changes communication between brands and people. Data analytics allows me to understand audience behavior with precision – when they interact, what they prefer, and how they feel. With artificial intelligence, I can generate personalized visuals, analyze market trends, and even predict which type of content will attract higher engagement.

For example, a restaurant campaign I managed used AI tools to create custom illustrations inspired by Ukrainian cuisine. This combination of tradition and innovation resonated with audiences much more deeply than standard advertising, proving that technology can enhance emotional storytelling.

Looking ahead, technologies will continue to evolve – becoming more accessible, intuitive, and interconnected. The rise of Internet of Things (IoT), augmented reality (AR), and AI-driven creativity will enable even small creators to reach global audiences instantly. Yet it is crucial to remember that technology is merely a tool; the human mind gives it purpose, emotion, and vision. Without

creativity and empathy, even the most advanced machine remains a lifeless code (boyd, 2010).

2. Culture in the digital era

Culture is the mirror of humanity – it reflects our values, dreams, and fears. In the digital age, culture no longer resides only in museums or concert halls. It thrives online – in short videos, memes, digital art, and virtual communities. Social media platforms such as Instagram, TikTok, and YouTube have become global cultural stages where creativity is shared, remixed, and reinvented every second

This transformation has democratized culture. Anyone with a smartphone can now become a creator, influencing thousands or even millions. Local traditions gain global visibility, and cultural exchange happens faster than ever. However, this speed also has a downside: in the race for attention, authenticity can be lost, and digital culture sometimes turns into superficial entertainment

In the food industry, I have observed how restaurant brands are becoming cultural storytellers rather than simple service providers. A café can communicate its identity through photos, colors, music, and narratives. For example, a Ukrainian café might share stories about local farmers, traditional recipes, and handmade ceramics – turning a simple meal into a cultural experience. Through digital storytelling, marketing becomes not only a business tool but also a bridge between tradition and innovation.

Future culture will be hybrid – merging physical and virtual spaces, personal and collective experiences. Technologies like virtual reality will enable people to attend digital art galleries or concerts from anywhere in the world, while still preserving emotional connection. But the main challenge will be to maintain human depth – to make sure that creativity remains rooted in real emotions and shared human stories.

3. The role of creative professionals

In the coming decades, creative professionals will play a crucial role in shaping the relationship between technology and humanity. They will serve as translators –

turning complex digital systems into meaningful cultural experiences. Their mission is not just to use technology but to humanize it.

As an SMM manager and creative strategist, I see my work as more than managing social media accounts. It is about creating emotional and visual experiences that connect people with brands and stories. A successful campaign requires more than technical skills – it demands empathy, aesthetic sensitivity, and a strategic understanding of how audiences think and feel (HubSpot, 2024).

When designing a campaign for a café, I integrate strategy, data, and art: selecting colors that evoke appetite and warmth, crafting narratives that reflect authenticity, and using analytics to refine the message. In this process, art and science collaborate. Data reveals patterns, but creativity transforms them into emotions (Hootsuite, 2023).

In the future, creative professionals will need to master new hybrid skills – combining artistic intuition with digital literacy, storytelling with analytics, and cultural awareness with technological innovation. Those who can unite these worlds will define the next generation of communication, marketing, and creative entrepreneurship.

Conclusion

The journey into the future is not only about technological evolution – it is about the evolution of humanity itself. Science and technology will continue to redefine our reality, but their true purpose lies in empowering human creativity and cultural diversity.

As we move forward, we must ensure that digital progress enhances – not replaces – human connection. The next generation of creative professionals must learn to merge innovation with empathy, aesthetics, and ethical responsibility.

Personally, as someone studying Creative Industries Management and working in social media marketing, I believe the future belongs to those who can unite technology and art to tell meaningful stories. Our task is to ensure that progress remains deeply human – rooted in compassion, imagination, and shared values.

The future of culture will indeed be digital – but it will also be profoundly emotional, inclusive, and human-centered. Through creativity and responsibility, we can make technology serve not only efficiency but also beauty, empathy, and understanding.

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MARKETING COMMUNICATION COMPLEX AS A TOOL FOR BUSINESS DEVELOPMENT

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Abstract. Ths paper examins the concept, structure, and practical implementation of the marketing communication complex as a key element of a company's strategic development. The study highlights the importance of integrating advertising, sales promotion, public relations, personal selling, direct marketing, and

digital marketing to achieve business goals and build strong customer relationships. The article emphasizes the role of digital marketing in enhancing communication efficiency and shaping consumer behavior in today's highly competitive market. Practical examples from leading international companies such as Coca-Cola, Apple, and Nike illustrate how integrated marketing communication helps strengthen brand identity, increase loyalty, and ensure sustainable growth.

Keywords: marketing communications, promotion, advertising, digital marketing, brand awareness, loyalty, strategy.

Introduction. Marketing communication is one of the most essential elements of modern business strategy. It enables companies to inform, persuade, and remind consumers about their products and services, creating awareness and stimulating demand. In a rapidly changing and competitive environment, businesses must develop effective communication systems to differentiate themselves and maintain long-term relationships with their customers (Kotler & Keller, 2021).

According to Philip Kotler, marketing communication represents "the means by which firms attempt to inform, persuade, and remind consumers about the products and brands they sell". Therefore, the marketing communication complex serves as a bridge between companies and their audiences, ensuring that messages are clear, consistent, and emotionally resonant.

The purpose of this paper is to analyze the structure, objectives, and practical use of the marketing communication complex and to highlight its significance in modern marketing practice (Sadigov, 2022).

1. The Essence and Structure of the Marketing Communication Complex

The marketing communication complex, also known as the promotional mix, is a structured set of interrelated tools used by a company to interact with its target audience. Its main goal is to influence consumer behavior, encourage purchases, and strengthen brand loyalty.

The classic components of the communication complex include:

- Advertising – paid, non-personal communication aimed at informing and persuading consumers;
- Sales promotion – short-term incentives designed to encourage immediate purchases;
- Public relations (PR) – activities aimed at maintaining a positive company image;
- Personal selling – direct interaction between sales representatives and customers;
- Direct marketing – personalized communication through various channels such as email or phone;
- Digital marketing – online communication through social media, websites, and digital ads.

The integration of these tools allows companies to create a unified communication system that delivers consistent messages and maximizes marketing effectiveness.

2. Goals and Importance of Marketing Communication

The goals of marketing communication are closely linked to a company's overall business objectives. The main ones include:

- Creating brand awareness – ensuring consumers recognize and recall the brand;
- Building a positive image – developing trust and credibility among customers;
- Stimulating sales and profits – increasing demand and revenue through targeted campaigns (Stud.com.ua.);
- Encouraging brand loyalty – maintaining long-term customer relationships;
- Communicating value – emphasizing product quality, uniqueness, and benefits.

Achieving these objectives requires a deep understanding of the target audience and consistent coordination across all communication channels.

3. Components of the Marketing Communication Complex

- Advertising. The most visible tool that informs, persuades, and reminds consumers. Modern ads focus on emotions and brand identity – Coca-Cola promotes happiness, Apple highlights innovation.
- Sales Promotion. Short-term incentives like discounts, coupons, and contests stimulate quick purchases and attract new customers.
- Public Relations. Builds a positive image through media, sponsorships, and social projects. Coca-Cola's environmental actions improve its reputation.
- Personal Selling. Direct interaction that builds trust, effective for complex or expensive products.
- Direct Marketing. Personalized communication via email or messages strengthens loyalty and allows result tracking.
- Digital Marketing. The key modern tool: social media, influencers, SEO, and online ads help analyze behavior and adapt campaigns. For example, a sugar-free bakery can use Instagram to attract health-conscious buyers.

4. Integration and Effectiveness of Marketing Communications

Integrated Marketing Communications (IMC) ensures all tools – advertising, PR, digital, and personal selling – deliver one clear message. This consistency strengthens credibility and impact. Companies like Nike combine ads, social media, and influencer marketing to maintain a strong global image. Effectiveness is tracked by brand awareness, sales, engagement, and feedback, with digital analytics helping adjust strategies in real time.

5. Practical Implications and Examples

Both global and small businesses apply IMC. Giants like Apple, Coca-Cola, and Nike use emotional storytelling and consistent branding, while smaller firms rely on social media and local PR. The main success factor is message consistency across all communication channels.

Conclusions. The marketing communication complex is an essential component of business strategy, enabling companies to effectively engage consumers and strengthen their market positions. A well-developed communication mix – integrating advertising, PR, sales promotion, direct, personal, and digital marketing – creates synergy and enhances brand effectiveness (Hrebenyukova, 2015).

In the era of digital transformation, communication strategies must focus on personalization, interactivity, and authenticity. Companies that successfully apply integrated marketing communications gain not only competitive advantages but also customer trust, loyalty, and long-term growth opportunities.

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VERGLEICHENDE ANALYSE DER ERGEBNISSE DES EINSATZES KÜNSTLICHER INTELLIGENZ IN VERSCHIEDENEN BEREICHEN

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Moderne Technologien verändern den Alltag der Gesellschaft. Sie werfen neue, drängende Fragen auf, darunter auch die Fragen moralischer Natur. Neue Technologien sind untrennbar mit der Entstehung und Entwicklung künstlicher Intelligenz verbunden. Dies erfordert eine systematische Analyse ihrer Nutzung, ihrer Auswirkungen und ihrer Folgen. So werden etablierte Berufe durch neue ersetzt. Sie verändern die bestehende Lebensweise und versprechen, eine neue zu schaffen. Mit dem Aufkommen neuer Technologien und künstlicher Intelligenz entstehen ethische Fragen und Herausforderungen. Diese Themen werden in den Arbeiten von Julia Bossmann untersucht und analysiert.

Künstliche Intelligenz wird zunehmend Bestandteil der Landschaft der neuen Technologien. Zu diesen Bereichen gehören Logistik, Forensik, Bankenüberwachung, Steuersysteme, Forschung und Übersetzung (Heift, 2020).

Künstliche Intelligenz wird aktiv in bekannten Technologieunternehmen wie Alphabet (Google), Amazon, Facebook, IBM und Microsoft eingesetzt. Die Arbeit dieser Unternehmen ist eng mit Persönlichkeiten wie Stephen Hawking und Elon Musk verbunden. Zu den Forschungsinteressen der Wissenschaftler gehören ethische Fragen und die Risikobewertung bei der Einführung künstlicher Intelligenz in neue Technologien.

Wissenschaftler haben die Themen wie Arbeitslosigkeit und den Arbeitsmarkt untersucht. Die Ergebnisse dieser Studien belegen einen deutlichen Einfluss der Automatisierung auf die Arbeitslosigkeit. Die Automatisierung technologischer Prozesse führt zur Entstehung neuer, komplexerer Berufe. Diese Berufe ermöglichen einen Übergang von körperlicher zu geistiger Arbeit. Solche Tätigkeiten sind typisch für strategische und administrative Aufgaben in unserer globalisierten Gesellschaft (Kim, 2023).

Die Forschungen im Bereich Logistik und Straßengüterverkehr führen zu folgenden Prognosen: Allein in den USA arbeiten Millionen von Menschen in der Transportbranche. Verschiedene Studien sagen den weitverbreiteten Einsatz autonomer Fahrzeuge voraus. Man erwartet, dass das Risiko von Verkehrsunfällen sinken. Autonome Lkws sind die optimale Wahl. Dasselbe gilt für Büroangestellte, da diese in Industrieländern die Mehrheit der Beschäftigten ausmachen.

Die Untersuchungen zur Verteilung der Gesamtproduktion führen zu folgenden Ergebnissen: Das moderne Wirtschaftssystem basiert auf der Vergütung wirtschaftlicher Leistungen. Diese Vergütung wird anhand von Stundenlöhnen berechnet. Die meisten Unternehmen im Produktions- und Dienstleistungssektor stützen sich nach wie vor auf Stundenlöhne. Durch den Einsatz künstlicher Intelligenz (KI) können Unternehmen ihre Abhängigkeit von Arbeitskräften deutlich reduzieren. Dadurch werden weniger Menschen von den Gewinnen profitieren. Infolgedessen werden diejenigen, denen KI-gestützte Unternehmen gehören, den Großteil des Einkommens erhalten, während die Ungleichheit zunimmt.

Es zeigt sich eine Umsatzlücke. Die Startup-Gründer erhalten den Großteil des Mehrwerts. Die Forscher führen ein Beispiel an, das auf einer Analyse der größten Detroiter Unternehmen basiert. Diese Unternehmen erhielten nahezu denselben Umsatz wie die größten Unternehmen im Silicon Valley. Allerdings beschäftigte das Silicon Valley nur ein Zehntel der Beschäftigten.

Das Ziel der Humanitätsforschung ist die Ermittlung des Einflusses von Maschinen auf das Verhalten von Arbeitnehmern. In der Produktion wirken die Menschen mit Maschinen zusammen. Diese Kommunikation weist Merkmale bewussten Handelns auf. Die Menschen sind in der Lage begrenzt, eine Empathie zu zeigen. Die Bots hingegen können fast unbegrenzte Ressourcen in den Aufbau von Beziehungen anlegen.

Ein sogenannter Bot kann beispielsweise die menschliche Aufmerksamkeit richtig lenken und bestimmte Handlungen anregen. Bei sachgemäßer Anwendung

könnte dies die Gesellschaft zur Bewegung zu rationalerem Verhalten beitragen. Die Folgen solcher Zusammenwirkungen könnten jedoch auch illegale Handlungen sein.

Von großer Bedeutung ist der Schutz vor Fehlern bei der Entwicklung von Technologien mit künstlicher Intelligenz.

Die Intelligenz entwickelt sich durch die Vervollkommnung grundlegender Fähigkeiten. Die Systeme durchlaufen typischerweise eine Trainingsphase, in der sie lernen, die richtigen Parameter zu erkennen und entsprechend den Eingaben zu reagieren. Sobald das System vollständig trainiert ist, kann es in die Testphase übergehen. Während der Testphase werden ihm verschiedene Beispiele präsentiert und seine Leistung überwacht.

Die Entwicklung künstlicher Intelligenz wirft wichtige ethische Fragen auf. Die Risiken negativer Folgen, sowohl rechtlicher als auch sozialer Art, müssen berücksichtigt werden. Dabei ist es wichtig, sich vor Augen zu halten, dass technologischer Fortschritt im Allgemeinen nur positive Ergebnisse bringen sollte. Künstliche Intelligenz birgt enormes Potenzial, und ihr verantwortungsvoller Einsatz liegt in unserer Verantwortung.

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Pinchuk D. V.

THE INVISIBLE CAPITAL OF COMMUNICATION: SPEAK OR LOSE

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Introduction

Communication has been one such invisible capital in present day organisation – a resource that is seldom measured, underappreciated, yet exerts an immense influence on the business performance. Companies tend to concentrate on financial, material or technological assets, and tend to ignore an intangible but extremely powerful factor – internal communication, which controls the efficiency, accuracy, and overall psychological climate of the team.

As I have learned through my own work on a different level (professional), the quality of communication has a direct impact on the economic performance of the firm as well as the emotional wellness of its workers. With different organizations with a different leadership style, I have experienced both an organized communication system and lack of internal communication mechanisms. Such contrasting conditions have informed me that communication is more than simply a means to finish a task; it is an extremely valuable asset in its own right for driving productivity, morale, and making decisions quickly.

In one company, departments existed completely on their own: they were not communicating in a deliberate system, duplicated their work and got conflicting instructions. It caused conflicts in the group, slowed down work, and lowered the results. Whereas, in a very different organisation, where I worked also, communication was one of the examples of a harmonious interaction here. Managers did not put distance between themselves and the team, were available, kept the conversation going, and truly led! But this sounded like the most effective illustration of a leader who goes forth and pulls the cart with the group, not just occupies the seat on it. Such a model cultivates a climate of trust, participation and high accountability.

This kind and contrasting of experiences proved crucial in my realization that the real cost of poor communication is far exceeding what you expect. This is why the issue of invisible communication capital is worthy of a research that unites theory, practice, and personal experience.

Theoretical principles

In nowadays management, communication is accepted not just as a means of conveying information but also as a new type of resource which underpins the efficient functioning of an organization. This is also known as an "intangible asset" or "intellectual capital" in scientific sources.

In this article, I chose a term I think captures my sense of what communication is, in companies: it has no physical form, but impacts work the same way as financial or material resources. In reality, invisible capital is a real-world term in the economy, and its use, in the literature, is that of resources that are not visible or measurable directly and in this way determine company's competitiveness, while being an invisible asset. These resources include reputation, corporate culture, team interaction, and employee competence. To that end, internal communication is a part of that capital because it is that which ensures that actions and processes are consistent, becomes transparent and helps with normalizing the nature of work, thereby sustaining working conditions. Good communication helps to make a stage of conditions for the company to develop itself: it can help in making decisions more quickly, reduce errors and clarify work processes. When internal interaction is effective, employees are better aligned in their work, cooperate more easily, solve problems faster. This, in turn, directly leads to economic outcomes. This phenomenon of underestimating communication causes organizations to overlook two seemingly small yet important elements – clarity of instructions, access to information, and transparency of accountability. Because of this work becomes chaotic and staff productivity starts taking a nosedive.

As a result, within today's conditions, internal communication is a separate type of management category that needs to be treated as a systematized approach and targeted at every level of management.

Communication as an economic resource

Communication is all seem to have a simple action, yet ultimately how coherently does the company function. Interaction between companies plays the key role in the speed of work, the completeness of work, and the efficacy of decision-making. Because of this, it is a resource of more importance than an auxiliary element. Open communication lessens mistakes, it is time saving, it helps people to know a common point of reference and it is a productivity enhancement.

Alternatively, discontinuities in communication result in chaos: people become mixed up, the roles can become blurry, and workers start doubting if they are being good at their jobs, leading them to lose their motivations and to drop out. At first the quality of communication has an instant bearing on economic performance from a corporate perspective and also directly determines the psychological comfort of the team. Communication problems gradually creep into being: tasks may be performed in an uncoordinated way, business units may duplicate labour; decisions will be pushed down due to a lack of information. Often companies attribute this to personnel shortages or technical problems, yet the real reason is a lack of coordination between people. These types of errors add up and result in significant time/resource losses.

Professional experience (updated and expanded). In fact, in my work has proved again and again that communication can serve as a cause of all sorts of problems when it can also be the fuel and the root cause of them. I worked under extremely different conditions, and it was these divergences that led me to understand clearer how communication is considered an invisible capital. I’d worked for one company, where I did some of the project tasks and the communication between departments was almost non-existent. Information was communicated unsystematically, often painfully slowly, and conflicting instructions were

administered to employees. This caused more conflicts, nervousness in the team and later failure in the projects. The people had sought to do so fairly efficiently but spent much time not working to get things done, but seeking to elucidate or try to find someone who had the proper information. Then I felt how costly chaos in communication can be.

I had a completely different experience at a very high-level company where they built internal communication. There was no traditional division into "managers" and "performers". The company's founders and directors were always interacting with the rest of the team. They didn´t pull away and never provide commands - they shared efforts, encouraged, and took part, involved in processes, an example of leadership they were not aloof. It reminded me of the well-known illustration of the true leader going ahead and pulling the cart with the team, rather than staying on the cart. This model of interaction instilled trust, engagement and joint responsibility.

Through this experience I realised that communication doesn't just affect efficiency; it shapes a culture where people want to work and grow. Where there is real connection, motivation need not be fabricated artificially: it comes organically. I recognized communication problems in real companies, too. The interaction between students even affected the quality in the school projects we have been involved in. For business analysis or enterprise performance analysis, we worked as teams and it was obvious to us: unless information is communicated clearly or if something is agreed on, "work falls to pieces".

As a result of this, I started to be more attentive to it in both my academic studies and working world. When studying in the finance field and doing analytical work of significance to me, the communication became more pronounced. When I calculated for one company it gave me a glimpse into how external factors can influence internal environment and alter financial indicators. It is precisely with how transparently and quickly a company communicates internally that their capability to adjust to external factors is determined. During such times, we see that

communication isn't an afterthought but a system that maintains the business equilibrium.

Conclusions

Communication is that ingredient of a company's workforce that typically is ignored, but it is what ensures the efficiency, stability and longevity of the enterprise. While studying this subject, I got convinced that internal interaction facilitates the success of the tasks, and it grounds the culture, motivation and decisions of the organization. In my work experience, where there is no communication or lack or chaos, I've seen that things lag behind and misunderstandings, errors, psychological stress and unnecessary expenses. Teams are open to outside influences, employees lose faith and confidence. Even work stalls in the absence of competent staff, because people have no single knowledge-frame.

Conversely, the situation at those organisations in which communication is valued is starkly different. Leaders collaborate with others; information is shared openly and understood; employees feel that their actions help shape the outcome. This helps forge a bond of trust and solidarity. It fortifies businesses in the face of adverse conditions. My university projects and analytical field experience prove that communication has an immediate economic effect. The way I learned through working with financial reporting, how the external environment changes the internal processes, and that quality communication allows organizations to adapt, reducing risks. Here we see again that communication is no mere abstract concept but a real managerial tool. Therefore, the invisible capital of communication is a resource which can tell how quickly and confidently a company will move forward. Business either talks and develops, or stays quiet and loses. And hence why the focus on communication is not a new trend but a must for the organizations hoping for stability and growth.

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Pintsov D. V.

THE IMPACT OF ONLINE LEARNING ON STUDENT MOTIVATION

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Online learning has become one of the most significant transformations in the field of education in the 21st century. The intensive development of digital technologies and their integration into the educational process have created the conditions for the emergence of new forms of learning, among which distance education attracts the greatest attention from scientists, teachers, and students.

The transition to online classes became especially large-scale during periods of global social and epidemiological change, which forced educational systems around the world to adapt traditional teaching methods in a short period of time. In this regard, the study of the impact of online learning on student motivation has become particularly relevant, as motivation is a key factor in the successful

acquisition of educational material and the development of professional competencies.

First, it is worth noting that the motivational sphere of students undergoes significant changes under distance-learning conditions. Unlike traditional education, where interaction with teachers and classmates takes place in a natural social environment, online learning requires a much higher level of autonomy, self-control, and self-organization. This creates both new opportunities and new challenges that affect students' level of engagement in the learning process.

It is necessary to consider changes in the communicative aspect of education. Traditional learning provides live interaction between students and teachers, which allows for quick responses to questions, professional dialogue, and adjustment of the learning process according to the needs of learners. In an online environment, communication often becomes more formal and is limited by time or technical constraints. Videoconferencing, e-mail, chats, and forums do not always provide a sufficient level of emotional and social interaction, which can lead to a decrease in intrinsic motivation. Students often note that the lack of direct contact creates a feeling of isolation and complicates the feedback process.

At the same time, online learning gives students greater freedom in organizing their time. Flexibility, the ability to study materials at a convenient time, and access to lecture recordings and electronic resources contribute to the development of independence and intrinsic motivation. Students can adapt their schedules to personal needs and combine learning with work or other responsibilities. In many cases, this is a key advantage that allows students to remain motivated even in difficult life situations.

An important factor influencing motivation is the quality and structure of distance courses. A well-designed course includes multimedia elements, quizzes, interactive exercises, group projects, and modular assessments. This approach maintains interest, increases activity, and promotes deeper learning. In contrast, courses based solely on text files or simple presentations quickly lose their ability to

hold students' attention, especially when lecture material lacks visual or interactive elements. Thus, the motivational potential of online learning largely depends on its pedagogical design.

The psychological aspect of distance education is also of particular importance. For students with strong self-organization skills, high self-discipline, and the ability to work independently, online learning is productive and beneficial. However, students accustomed to external control, strict schedules, and constant teacher presence may experience decreased motivation. The lack of external regulation often leads to procrastination, reduced concentration, and difficulties in planning learning activities.

Digital literacy also plays a significant role. Although modern students are familiar with digital devices, not all possess sufficient skills to use educational platforms effectively. Technical difficulties, unstable internet connections, and limited knowledge of learning-management systems can negatively affect motivation. Students facing such problems may feel frustrated and uncertain, which hinders active participation in the learning process.

Equally important is the teacher's role in creating a motivating online learning environment. Teachers who actively use digital tools, involve students in discussions, design interactive tasks, and provide regular, constructive feedback can significantly enhance motivation. Feedback is especially crucial in distance learning, as it compensates for the lack of direct communication and provides essential academic support.

Socialization is another essential element of student motivation. Traditional education offers opportunities for communication, collaboration, and extracurricular involvement. Online learning may limit these experiences, leading to feelings of social isolation. However, well-organized online communities, virtual group projects, discussion forums, and collaborative tasks can effectively compensate for this deficit and increase student engagement.

One common challenge of distance education is cognitive overload caused by large volumes of digital material and frequent switching between platforms. Information overload can result in fatigue, reduced concentration, and decreased motivation. Teachers should consider this when designing course content and structuring learning tasks.

Technical aspects also influence motivation. Platforms with complex interfaces or frequent technical issues create additional stress and distract students from learning. Conversely, stable and user-friendly platforms enhance learning experience and sustain motivation.

Assessment in online learning deserves special attention. Formative assessment, including quizzes, discussions, and small assignments, helps maintain consistent engagement. Regular evaluation gives students a sense of control over their progress, increasing motivation. Conversely, unclear grading criteria or insufficient feedback can reduce learning activity.

In conclusion, the impact of online learning on student motivation is multifaceted and depends on a combination of internal and external factors. Key advantages include flexibility, accessibility, independence, and individualized pacing, while challenges include limited social interaction, self-organization difficulties, information overload, and varying levels of digital competence. The primary task of educators and institutions is to create supportive conditions that help students maintain high motivation. When properly organized, distance learning can serve not only as an alternative but also as an effective complement to traditional education.

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PERSONALISATION, FLEXIBILITY, AND PRODUCTIVITY: THE ROLE OF DIGITALISATION IN INTELLECTUAL WORK

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Modern digitalisation is radically changing economic, social and labour processes. In 2016–2018, economists such as M. Knickrem, B. Burton, P. Doherty, R. Buch and R. Hicks viewed the digital economy primarily as a technological transformation of business. They emphasised digital resources: skills, equipment, intermediate goods and services, and the role of platform companies (Google, Facebook, Amazon, eBay, Alibaba) and digital products for new business models. At that time, digitalisation was perceived primarily as a tool for improving business efficiency, without in-depth analysis of its impact on the labour market and employment structure (Nazarova et al., 2024, p. 460).

Today, the approach has changed significantly. Recent studies, in particular the works of Daron Acemoglu (2024) and David Deming (2024), emphasise that digitalisation is not only technical modernisation, but also a factor in fundamental changes in the nature of work and professional competencies. Artificial intelligence and the automation of routine tasks complement human labour rather than replace it entirely, which changes the demand for workers with high soft skills and multidisciplinary knowledge. At the same time, they create pressure on wages,

increase inequality and necessitate continuous training and retraining of personnel. Current research shows that digitalisation is shaping new forms of employment such as remote, project-based and flexible work, changing recruitment mechanisms and increasing the importance of asynchronous work and personalised schedules. In other words, while the digital economy was previously seen as a technological platform for business, today it is a complex socio-economic process that directly affects the labour market, the structure of jobs and the development of employee competencies. This analysis demonstrates that the digitalisation and digitisation of intellectual labour are changing the labour market, increasing the role of skilled professionals and adaptive competencies, while creating new challenges for wages and employment structures (Acemoglu, 2024).

The digitisation of intellectual work is closely linked to innovation and significantly expands business opportunities in the digital sphere, radically changing the way, place and time of work. Thanks to continuous technological improvements, especially in the field of business communications, the time required to implement complex processes, such as creating a new car design, is reduced from 60 months five years ago to 24-36 months today. The introduction of new technologies affects the organisation of work and the level of employment in certain sectors of the economy: although some professions are changing or declining, new jobs with different functional responsibilities are emerging, often in related or completely new areas (Tul, 2021, p. 1-4, 26).

Digitalised intellectual work is not tied to a specific place or time, and modern technologies allow most business processes to be performed remotely, including negotiations, strategic planning, logistics and financial management. The digital office is becoming auxiliary, and access to talented employees is possible regardless of their location, as demonstrated by Basecamp, Herman Miller, Fotolia, and Jellyvision. Asynchronous work by employees in different time zones increases productivity and profitability, while e-workers independently allocate their time,

adjusting their schedule and workload according to project needs, which increases their responsibility and efficiency (Filipishyna, 2018).

An important component of digitalised work is effective communication within virtual teams. Various tools are used for this purpose: Bitbucket, WebEx, Skype, Dropbox, Google Docs and others, which enable collaboration, task organisation and preservation of corporate culture. Digitalisation is aimed at creative professions and highly qualified intellectual workers, such as programmers, system administrators, web designers, marketers, engineers, copywriters, translators, and managers. Demand for these professions is growing, and the most valuable specialists are those who have multidisciplinary knowledge and are able to work at the intersection of several professions. In the future, there is expected to be demand for specialists who work with virtual worlds, neurointerfaces, digital linguistics, and cybersecurity (Filipishyna, 2018).

Digitalisation is transforming the role of employees and consumers in the digital environment, shaping new models of interaction. According to Tatyana Krainikova's concept of media prosumerism (Krainikova, 2023), modern consumers not only receive content, but also actively create it, influence the media space and participate in production processes. Crowdsourcing and involving users in the creation of ideas and products increase the adaptability of services to market needs, stimulate creativity and engage participants in the digital environment.

Digitised work is multifunctional, employees perform diverse tasks and are valued for their multi-professional skills and ability to work with a large flow of information, while self-organisation and self-control skills, including planning, goal setting and priority monitoring, are important. Motivation in digital companies is results-oriented, with a project-based reward system that encourages knowledge workers to achieve personal and team goals, and financial rewards play an important but not dominant role. Digitalisation provides a level playing field for all participants in labour relations. Regardless of their place of work, all employees have equal access to resources, equal working and leisure conditions, and are paid at average

global rates, which allows companies to attract the most qualified and loyal specialists. Thus, the digitalisation of the economy is a process of continuous transformation of social, economic, labour and technological processes. It creates new opportunities for increasing productivity and flexibility in the labour market, but at the same time poses social risks by affecting the structure of employment, competence requirements and working conditions. It is these aspects that are the subject of this study, the aim of which is to identify the social consequences of digitalisation and their impact on the transformation of the labour market (Nazarova et al., 2024, p. 469).

At the same time, digitalisation can lead to market concentration in the hands of large technology corporations, which restricts competition and exacerbates economic inequality. Automation reduces the number of jobs in areas involving routine operations, which threatens structural unemployment among low-skilled workers. The income gap between workers with digital skills and those without deepens socio-economic inequality. In addition, there are growing risks to personal data security, as well as psychological and social challenges for workers, including technostress, information overload, and blurring of the boundaries between work and personal life, which negatively affect their mental health and engagement in the work process (Nazarova et al., 2024; Tul, 2021).

Thus, it has been proven that as a result of digital transformation, the modern labor market and business processes are undergoing profound changes, and their efficiency and productivity are increasing due to the implementation of Big Data, artificial intelligence, and automated technologies. It allows for more accurate forecasting of labour market needs, identification of relevant skills and adaptation of educational programmes, which contributes to the training of highly qualified personnel. Digital technologies expand the possibilities for remote and asynchronous work, personalise the workspace and schedule, and increase employee motivation, responsibility, and performance. In addition, digitalisation creates new professions, develops multidisciplinary skills and allows companies to attract talented specialists

regardless of their location, making the labour market more flexible, competitive and results-oriented.

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Teriaiev D. O.

FROM IMAGINATION TO REALITY: HOW TECHNOLOGY AND CULTURE TRANSFORM SOCIETY

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Imagining the future is not an easy task, as it is difficult to predict precisely what will happen. Nevertheless, reflecting on this topic helps to organise thoughts and develop a clearer understanding of possible directions of social and technological change. The development of technology over the coming decades raises particular interest, especially for students of automotive engineering, as many of these changes will directly affect everyday life and the functioning of vehicles. Writing down such reflections allows for a more structured consideration of future developments.

One of the most significant technological trends is 3D printing. At present, it is already widely used, yet its full potential has not been realised. In the next decade, 3D printing is expected to become much more common. Individuals may begin printing decorations, furniture, small tools, and possibly car parts at home. At the industrial level, factories are likely to use high-speed printers to manufacture components such as car frames and building elements. However, this technology is unlikely to become widespread among ordinary users before the 2030s. Students may experiment with home 3D printers, producing parts for projects or testing ideas, which could serve as an effective way to develop practical skills.

Virtual reality represents another rapidly developing area. Existing games such as Minecraft or Kerbal Space Program illustrate only the early stages of this technology. In the future, virtual reality is expected to become more realistic and useful not only for entertainment but also for education and professional training. For example, students may practise car repairs or simulate traffic situations in virtual environments before working with real vehicles. Such an approach could make learning safer, more efficient, and more engaging.

Self-driving vehicles are already present on public roads; however, their initial large-scale use is likely to involve trucks and buses. Private car use is expected to

remain largely unchanged until the 2030s. At the same time, electric vehicles will continue to increase in popularity, encouraging greater public awareness of environmental issues.

Drones are becoming increasingly common and may soon be used extensively for deliveries and personal purposes. Artificial intelligence and android technologies will continue to develop, although the replacement of human labour presents a major challenge. This process may cause concern, but it also raises questions about how society will adapt. Renewable energy is expected to grow rapidly. Solar power is becoming more affordable, and environmentally oriented city designs may become more widespread. Future urban environments are likely to prioritise sustainability, requiring engineers to work with new systems and technologies.

Space travel is likely to remain primarily accessible to governments and wealthy individuals. Private companies will continue experimental missions, and humans may again move beyond low Earth orbit. While Mars exploration remains distant, private space companies may attempt missions within the next few decades. The internet, smartphones, and social media are expected to remain largely unchanged, although voice commands may improve and virtual reality integration may increase.

Political and social changes are particularly difficult to predict. Populism and political polarisation are currently increasing and may continue to do so in the coming decade. Public protests against systems perceived as unfair may become more frequent. On the political right, nationalism and protectionism may strengthen, while on the left, environmentalism and social justice issues may gain greater prominence. Internet privacy and net neutrality are likely to remain topics of debate. Global conflicts and wars are unpredictable. The Middle East may continue to experience instability, and poorer countries may see limited improvement. However, technologies such as 3D printing could transform certain industries in developing regions by enabling local production. Despite this potential, poverty, famine, and

conflict are expected to remain serious global challenges, contributing to instability in many parts of the world.

Media and culture will also continue to evolve. Social media is likely to dominate popular culture, particularly as younger generations mature. Online creators, vloggers, and streamers may increasingly replace traditional celebrities as cultural role models. While television and cinema will persist, they may no longer define culture in the same way. Music trends will continue to change. Although hip hop has dominated for decades, alternative and experimental genres may enter the mainstream. Electronic, indie, and mixed-genre music is likely to gain influence, while pop and R&B will remain popular, and rock music may become more niche. Fashion trends will remain unpredictable, with social media shaping personal expression and style. Identity politics and political movements are also expected to influence cultural development, with greater attention given to creators perceived as relatable and authentic. Traditional celebrity culture may gradually decline in favour of influencers.

Transportation systems are expected to undergo significant transformation. Electric and alternative-fuel vehicles are likely to dominate, and flying cars may become available for short-distance travel in wealthier cities. Public transport may integrate advanced technologies, including artificial intelligence and virtual assistance. As a result, the automotive industry will need to adapt rapidly, and future specialists will be required to understand both traditional mechanical systems and emerging technologies. Energy systems will also change. Fossil fuels are expected to gradually decline, while renewable sources such as solar, wind, and hydrogen energy gain importance. These changes will create both challenges and opportunities for engineers, inventors, and entrepreneurs.

Healthcare is likely to experience a significant transformation. Advanced diagnostic tools and medical technologies may become more accessible and affordable. This could enable faster identification of health issues and more personalised treatment approaches based on individual biological characteristics.

Education and learning methods are also expected to evolve. Digital tools, simulations, and virtual reality-based laboratories may become more common, particularly in engineering and scientific disciplines, making education more interactive and practice-oriented.

Despite rapid technological and cultural development, the human element will remain essential. People will continue to seek connection, creativity, and self-expression. Although challenges such as job displacement due to artificial intelligence and climate change will intensify, human adaptability remains a key factor. The coming decades are expected to combine excitement and uncertainty, shaped by the interaction of science, technology, and culture. For students, this period presents both motivation and responsibility, requiring continuous learning, adaptation, and innovation. The complexity of the future makes it not only uncertain but also worthy of careful consideration.

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THE ROLE OF SCIENCE, CULTURE, AND TECHNOLOGY IN THE TRANSFORMATION OF MODERN SOCIETY

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The twenty-first century marks the beginning of an entirely new era in human history – an era in which science, culture, and technology are becoming the main driving forces of civilisation. The world is changing faster than ever before, and humanity is witnessing the formation of a future that previously existed only in the imagination of writers and thinkers. Under these conditions, the analysis and understanding of ongoing transformations become an essential task for educated societies in order to use accumulated knowledge for the benefit of humanity.

Science will continue to serve as the foundation of global progress. Each discovery in physics, chemistry, biology, or astronomy expands human understanding of the universe. The future of science is increasingly associated with collaboration and interdisciplinarity. Researchers are no longer expected to work in isolation; instead, cooperation across disciplines and national borders is becoming the norm. Artificial intelligence, quantum computing, and genetic engineering are expected to transform medicine, communication, and even perceptions of human consciousness. At the same time, these advances raise concerns regarding their ethical use and social consequences.

Medicine is likely to undergo one of the most significant transformations. The integration of artificial intelligence, robotics, and biotechnology may allow for the prediction of diseases before symptoms appear, the development of personalised treatment programmes, and the extension of human life expectancy. Such progress raises ethical questions related to accessibility and equality. The medical professional of the future may need to combine scientific expertise with a deep understanding of the moral implications of technological advancement.

Technology has already had a profound influence on culture and everyday life. Digital devices have changed patterns of thinking, working, and communication. The

Internet has increased global connectivity, while virtual and augmented reality technologies are reshaping art and education. Despite these developments, technology is not expected to replace human emotions or creativity. While machines can process data efficiently, creativity, empathy, and emotional expression remain inherently human qualities. In this sense, technology may support, rather than diminish, human development.

Culture continues to function as the core of civilisation. In the context of globalisation, preserving cultural diversity and respecting national traditions remain crucial. The future world may be understood as a global mosaic composed of languages, customs, and values. Technological development, including automotive engineering, reflects cultural exchange and collective creativity. Engineering solutions, much like cultural traditions, embody the experience and mindset of their creators. International cooperation allows countries to share innovations and develop safer, more efficient, and environmentally sustainable technologies.

The digital era also offers opportunities for cultural preservation. Online platforms and digital archives can document endangered languages and traditions, while modern communication technologies connect individuals across continents. When applied responsibly, globalisation has the potential to unite humanity without erasing cultural diversity.

Art and literature are also expected to transform. Artificial intelligence is increasingly capable of generating texts, images, and music; however, human creativity remains irreplaceable. Artistic expression originates from emotion and lived experience, which cannot be fully replicated by algorithms. Cultural development may therefore continue to serve as a moral guide in a technologically advanced world.

Education will undergo substantial change as well. Virtual learning environments may replace traditional classrooms, enabling global interaction among students. In this context, the role of the teacher is likely to shift from information delivery to mentorship. Skills such as critical thinking, creativity, and emotional

intelligence may become more valuable than rote memorisation. Education of the future may focus not only on professional success but also on personal and social development.

At the same time, future development presents serious challenges. Climate change, overpopulation, and social inequality require urgent solutions. Automation and artificial intelligence may create new professions while eliminating others, potentially increasing economic inequality. Addressing these issues will require adaptability, lifelong learning, and international cooperation.

Space exploration represents another promising direction of future development. Projects involving lunar bases, Mars colonisation, and deep-space missions raise not only scientific but also philosophical questions. Observing Earth from space emphasises the fragility of the planet and may encourage a sense of shared responsibility among nations.

Ultimately, the future depends not solely on technological innovation but on human potential. While machines can calculate and optimise, qualities such as imagination, empathy, and moral responsibility remain uniquely human. Science, culture, and technology must function in balance to ensure that progress supports humanity rather than undermines it.

In conclusion, the future represents not only a technological trajectory but also a moral and cultural challenge. Scientific and technological achievements should serve human values and contribute to peaceful coexistence, cultural enrichment, and environmental responsibility. The future reflects collective choices, and its outcome depends on how responsibly humanity chooses to apply its knowledge and innovations.

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TECHNOLOGICAL ADVANCEMENTS OF THE FUTURE AND THEIR IMPACT ON OUR DAILY LIVES

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For as long as human race existed, we have always been curious. This is one of the traits that has made us into who we are today. Curiosity has led innovation and scientific discoveries from the creation of agrarian tools and first weapons to space exploration and building artificial intelligence with the potential to surpass humans in all possible ways. We as a race have always tried to guess the future, drew our wildest ideas and put them into time capsules, sometimes we underestimated the innovation that will have been made, sometimes we were close, yet most of the time we greatly overestimated the things we could create in a short amount of time, like flying cars, for instance.

For as long as human race existed, we have always been curious. This is one of the traits that has made us into who we are today. Curiosity has led innovation and scientific discoveries from the creation of agrarian tools and first weapons to space exploration and building artificial intelligence with the potential to surpass humans in all possible ways (Hawking, 2018). We as a race have always tried to guess the future, drew our wildest ideas and put them into time capsules, sometimes we underestimated the innovation that will have been made, sometimes we were close, yet most of the time we greatly overestimated the things we could create in a short amount of time, like flying cars, for instance (Johnson, 2022).

Journey always have been looking uncertain for us; we keep trying to guess and do our best to predict future progress and innovation. This tendency is still present nowadays, and here we are trying to guess into 2050 and beyond, how will we live, what will be our job market and how our families will be structured (World Economic Forum, 2023). It is hard to nail it and make a serious forecast, without the analysis, mathematical models and the collection of vast knowledge about our past trends and ways of development as a race, yet still I will try my best to do it (Brynjolfsson & McAfee, 2014).

For more accurate prediction, I decided to take 2050 as a reference point for the forecast, as future is quite a vague metric to make refectory analysis afterwards and decide is predictions were accurate or not. The first point is science; science has always been a main tool to realize our internal curiosity and learn more about the beautiful world we live in. From the dawn of time, every year we have been finding our new things, making new breakthroughs and becoming more intelligent and smarter (Harari, 2018). Fast forward thousands of years, nothing really changed, we are still hungry for innovation, experiments and hidden secrets of our planet, the universe we live in and even us ourselves (Tegmark, 2017). In 2050 I believe the tendencies will continue and our scientists will have found the remedy to cure most of the illnesses and diseases we have today and will have in the future (Kurzweil, 2024). Furthermore, I want to believe that we will figure out not only how to live longer, yet to do it fully, actively and with joy (Bostrom, 2016). Additionally, I hope that till 2050 the world will not be taken over by Artificial General Intelligence and there will be no signs of it happening. Moreover, I prospect that AI will serve humanity and will be the main driver of developing things in months that would take human decades, things like illness remedies, economic stabilization assistance and the purification of our beautiful Earth (Anderson & Rainie, 2021).

Moving to Technology, as it is connected with science, there will be certain overlapping in trends, as I am convinced that technology will be the main driver of science in the coming years, especially taking into account rapid development of

Artificial Intelligence (Tegmark, 2017). Talking about the things that will be a part of our normal lives in 2050, I believe there will be many. Some of which we can see now, like the smart glasses and lenses instead of our usual smartphones, development of flying vehicles, and powerful hardware for our daily devices (Johnson, 2022). Technology of the future will allow people to make more with what they have performed wise, yet the law and government systems will become stricter and stricter regarding the use of the technologies, to prevent massive cyber-attacks (Kello, 2017). Speaking about cyber-attacks, I also believe that cyber security will become more important for the government than an army, as the majority of attacks will be done through the internet and by leveraging information (Anderson & Rainie, 2021). The development of the technology will additionally likely push the transition for all-remote work environments, with people spending more time alone at home (OECD, 2024). People will interact less with the peers and the surrounding environment and therefore there would be less couples and marriages. It can be vividly observed in Japan nowadays in 2025, where young people refuse to go out and meet. They would rather sit at home talking only to themselves and online friends than spend time searching, getting rejected and heartbroken (BBC News, 2013).

With that in mind, we are moving to culture of the future and its trends. In my opinion with the rapid development of AI and digitalization of all parts of our live, people will stay at home more and more and therefore most of the world will consist of sociopaths. This terrifying trend will lead to the decrease in the number of couples, marriages and kids as a result (United Nations, 2022). The population of the planet in the developed countries will drop and the demographics of our planet will largely change. Main living social groups will sooner or later be Muslims, Africans and Indians, with white population such as Europe and United States will continue to drop at the frightening rates (Pew Research Center, 2023). This will cause a large shift in the cultures of many countries and will likely cause the downfall and the end of many nations.

To summarize all aforementioned, future is unknown and therefore scary, yet the good news is it is still in the future, meaning that we can change it and make it what we want it to be. Certain decisions are irreversible and there is nothing we can do about it, yet what is crucial is what we do today, our daily choices. If all humans living right now, will understand the importance of their actions, decisions and will think more instead of spending hours a day on social media. If people will spend more time together rather than on a screen and if we will finally understand that our and our planet's health and wellbeing is far more important than big house and fast supercar, we still have a big chance for our home to be bright and filled with smiles and kid's laugher (Harari, 2018).

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ECONOMIC SCIENCES

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THE FUTURE OF WORK: HOW AUTOMATION AND AI ARE RESHAPING LABOR MARKETS

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AI-driven automation is reshaping the balance between high-skilled and low-skilled labor by increasing the value of workers who can design, manage, or collaborate with advanced technologies, while reducing the need for routine, repetitive tasks that machines can easily perform. As AI becomes more integrated into production and services, demand rises for specialists in data analysis, software development, engineering, and strategic decision-making, roles that are complemented rather than replaced by technology. At the same time, many low-skilled routine jobs decline, especially in manufacturing, administration, and basic customer service, where automation can deliver faster and cheaper results. However, not all low-skilled work disappears; jobs requiring physical presence, emotional interaction, or complex manual skills, such as caregiving, hospitality, and maintenance, remain in demand, though often without significant wage growth. The overall effect is a polarized labor market in which high-skill, high-wage jobs expand, middle-skill routine jobs shrink, and certain low-skill service roles persist. This transformation pushes workers toward continuous learning, digital literacy, and adaptability, as skills become more important than formal degrees in navigating the future of work (Autor, 2015).

AI-driven automation affects different sectors unevenly, and the pattern is relatively clear: industries built on routine, predictable tasks face the highest risk of job displacement, while sectors that rely on creativity, complex problem-solving, interpersonal interaction, or physical presence tend to grow. Manufacturing, basic administrative services, transportation, logistics, and routine customer support are

among the most vulnerable because many of their core tasks can be standardized and automated. In contrast, sectors such as healthcare, education, advanced technology, green energy, and creative industries are expected to expand, partly because they require human judgment, empathy, or specialized expertise that AI cannot fully replicate. Service jobs involving direct human contact, like caregiving, hospitality, and personal services, also continue to grow, though often without significant wage increases. Overall, automation pushes the economy toward sectors that combine human skills with technological tools, while shrinking those that depend on repetitive manual or cognitive tasks (Frey, 2017).

AI also has a powerful and uneven effect on wage inequality, both within individual countries and across the global economy, because it tends to reward workers and regions that already possess advanced skills, strong institutions, and access to technology. Within countries, AI raises the wages of highly skilled workers who can design, manage, or complement intelligent systems, while reducing or stagnating wages for workers performing routine tasks that can be automated. This widens the gap between top earners and everyone else, especially in economies where education and retraining systems are slow to adapt.

Middle-skill jobs are particularly vulnerable, which hollowizes the wage structure and pushes many workers either upward into more specialized roles or downward into lower-paid service work. Between countries, AI deepens global inequality because technologically advanced nations benefit far more from automation than developing economies. Wealthier countries have the infrastructure, capital, and research capacity to adopt AI quickly, boosting productivity and wages for their skilled workforce. Meanwhile, developing countries risk losing their traditional advantage in low-cost labor, as automation reduces the incentive for companies to outsource manufacturing or routine services abroad. Countries that successfully invest in digital skills and innovation can narrow the gap, while those that fall behind may experience a widening divide. In short, AI amplifies existing

inequalities unless governments and institutions actively invest in education, digital access, and inclusive technological development (Manyika, 2017).

As AI becomes more deeply integrated into the economy, it creates entirely new categories of work that blend human judgment with machine capabilities, many of which did not exist even a few years ago. One major area of growth involves roles focused on building, maintaining, and supervising intelligent systems, such as AI ethicists who ensure algorithms behave responsibly, AI auditors who check systems for bias or errors, and prompt engineers who specialize in shaping how AI models respond to human instructions. Another emerging group of professions centers on collaboration between humans and machines, including AI trainers who teach models to recognize patterns, synthetic-data specialists who generate artificial datasets for training, and human-in-the-loop supervisors who monitor automated decision-making in sensitive fields like healthcare or finance. Beyond the technical sphere, AI also creates opportunities in creative and service-oriented industries.

New roles appear in digital content production, such as virtual-world designers, augmented-reality experience creators, and AI-assisted filmmakers who use intelligent tools to speed up production. In business and management, companies increasingly need automation strategists who redesign workflows around AI, as well as productivity consultants who help organizations integrate intelligent tools effectively. Even traditional sectors like healthcare and education are evolving, giving rise to professions such as AI-supported medical technicians, personalized learning designers, and specialists who adapt AI tools for patient care or classroom use. Overall, the professions of the future are defined less by replacing humans and more by combining human strengths, creativity, empathy, judgment, with the speed and analytical power of AI (Susskind & Susskind, 2015).

Remote work technologies and AI are reshaping global labor mobility by weakening the traditional link between where people live and where economic opportunity exists. As digital collaboration tools, cloud platforms, and AI-supported workflows become more sophisticated, many jobs no longer require physical

presence, allowing companies to hire talent from anywhere and enabling workers to participate in global labor markets without relocating. This shift reduces the importance of geographic proximity and makes skills, rather than location, the primary driver of opportunity. At the same time, AI automates coordination, translation, scheduling, and project management, lowering barriers for cross-border teamwork and making international collaboration smoother and cheaper. However, this transformation does not benefit all regions equally.

Highly skilled workers in developing countries gain new access to well-paid remote jobs, but low-skilled workers may find fewer opportunities as routine tasks become automated rather than outsourced. Countries with strong digital infrastructure and stable regulatory environments attract remote-first companies, while regions lacking connectivity risk being left behind. Meanwhile, traditional migration patterns may slow as fewer workers need to move physically to access better jobs, although specialized professions still require in-person presence. Overall, AI and remote work technologies create a more fluid, globally distributed labor market, but they also introduce new inequalities based on digital access, education, and the ability to work effectively with advanced tools (Baldwin, 2019).

To sum up, remote work technologies and AI are loosening the connection between where people live and where economic opportunity exists, allowing many workers to participate in global labor markets without relocating. Companies can hire talent from anywhere, while AI tools make cross-border collaboration smoother by automating coordination, translation, and project management. This benefits skilled workers in developing countries but reduces opportunities for low-skilled labor that used to rely on outsourcing. Countries with strong digital infrastructure gain an advantage, while regions lacking connectivity risk falling behind. Overall, AI creates a more globally distributed labor market, but it also introduces new inequalities based on digital access and the ability to work effectively with advanced tools (McKinsey, 2022).

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DIGITAL TRANSFORMATION OF THE ENTERPRISE MANAGEMENT SYSTEM AS A FACTOR OF INCREASING COMPETITIVENESS

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The contemporary competitive landscape forces enterprises to rethink management systems not as a set of isolated functions, but as an integrated socio-technical architecture that must be continuously reconfigured through digital technologies. Following Vial, digital transformation is understood as a process in which digital technologies trigger significant changes in value-creation logic, organizational structures, and management practices (Vial, 2019). For a firm, this process does not reduce to the automation of single operations. However, it implies the redesign of strategic, tactical, and operational management circuits to accelerate decision-making, reduce transaction costs, and strengthen market positions.

Building on this line of reasoning, digital transformation impacts competitiveness through several interrelated mechanisms. First, the digitalization of internal processes increases operational efficiency. End-to-end integration of ERP, CRM, supply chain, and financial systems reduces information asymmetry between departments, shortens planning cycles, and diminishes the number of manual operations that generate errors and delays. Second, digital technologies expand the strategic perimeter of management decisions. Access to real-time market data, customer analytics, and predictive models allows managers to move from reactive adaptation to proactive configuration of product portfolios and channels. Third, digital platforms enable new forms of value creation based on ecosystems, data-driven services, and innovative, connected products that change the rules of competition in entire industries (Porter & Heppelmann, 2014).

Bharadwaj and co-authors argue that digital business strategy must be seen as a fusion of business and IT strategy, where digital resources become central to competitive logic rather than a supporting function (Kane et al., 2015). This fusion transforms the design of the management system in at least three directions. Decision-making becomes data-centric because strategic and operational choices are based on integrated analytical dashboards rather than fragmented reports. The organizational structure becomes more modular and agile, with cross-functional teams responsible for customer journeys and digital products, rather than rigid functional silos. Governance mechanisms shift from hierarchical control to the portfolio management of digital initiatives, where management evaluates synergies, risks, and scalability of projects within a unified framework.

Porter and Heppelmann demonstrate that smart, connected products generate new streams of operational and customer data, which can be integrated into the management system and utilized for the continuous refinement of strategy, pricing, and service models (Ionin, 2024). When sensors, embedded software, and connectivity are combined with cloud platforms, management obtains a digital representation of the installed base of products. Such a representation makes possible

remote diagnostics, predictive maintenance, personalized offers, and outcome-based contracts. Each of these models strengthens competitive positions, but only if the management system is capable of processing the corresponding data in near real-time and turning it into coordinated decisions for marketing, production, logistics, and service units.

Kane and colleagues, analysing a large empirical sample of firms in different industries, demonstrate that successful digital transformation depends more on strategy, leadership and culture than on the mere volume of technological investments (Bharadwaj et al., 2013). Enterprises that achieve higher digital maturity display several recurrent features. Leadership formulates a clear vision of how digital technologies should transform the business model and management processes, and consistently communicates this vision. Management encourages experimentation, accepting that not every digital initiative will be successful, but each project generates learning effects. Human resource management invests in the development of digital skills, analytical competencies, and cross-functional collaboration to enhance organizational effectiveness. Under these conditions, digital tools become embedded in everyday routines and begin to affect productivity, innovation, and customer satisfaction systematically.

Extending this view to the internal architecture of the enterprise, a digitally transformed management system usually builds on several layers. At the infrastructural layer, the enterprise deploys cloud platforms, network connectivity, and cybersecurity solutions, creating a resilient technical basis for further integration. At the data layer, the firm develops corporate data warehouses, master data management, and data quality rules, ensuring that indicators across different departments are consistent and comparable. At the application layer, process automation is implemented through ERP, CRM, SCM, manufacturing execution systems, project management tools, and low-code platforms. At the analytical layer, business intelligence, predictive analytics, and visualization tools provide managers with near real-time insights into performance, risks, and opportunities. At the

coordination layer, management procedures, regulations, and key performance indicators are revised to align incentives with new digital possibilities (Ionin, 2024).

These layers form a coherent whole because competitiveness arises from their joint effects rather than from isolated technologies. Reduction of production cycle time results from the combination of real-time demand forecasting, automated inventory replenishment, integrated planning between sales and operations, and continuous monitoring of equipment. Improvement of customer experience depends on the interplay between CRM analytics, omnichannel communication, personalized recommendation engines, and service management. Entry into new markets becomes feasible when digital platforms support remote delivery, online contracting, and integration with partners' systems. In each case, management quality determines whether the enterprise converts technological options into sustainable advantages or limits itself to fragmented pilots without a notable effect on market position.

The trajectory of digital transformation of the management system can be described as a sequence of stages that reflect deepening integration. At the initial stage, enterprises typically implement isolated digital projects focused on basic automation of accounting, inventory, or sales. At the consolidation stage, management recognizes the fragmentation of solutions and initiates integration of core systems into a single information space, often through ERP and unified customer databases. At the strategic stage, the firm formulates a coherent digital strategy that links technological priorities with competitive positioning, defining which processes, products and markets should be transformed first. At the ecosystem stage, the enterprise uses platforms, APIs, and data sharing to coordinate value creation with suppliers, distributors, and complementary service providers. Each subsequent stage increases the complexity of the management system, but simultaneously enlarges the set of instruments for competitive struggle and the ability to reshape industry boundaries.

Ionin, analysing digital transformation in company management with regard to Ukraine, emphasizes that the competitive impact of digitalization is moderated by

institutional and infrastructural conditions (Porter & Heppelmann, 2014). Enterprises operating in environments with underdeveloped broadband infrastructure, low digital skills and regulatory uncertainty face higher costs and risks. For them, management must pay special attention to the prioritization of projects, the selection of partners, and the adaptation of foreign technological solutions to local constraints. At the same time, the gradual digitalization of public services, the financial sector, and logistics presents additional opportunities for integrating corporate systems with national digital platforms, which reduces transaction costs and expands market reach. In such contexts, digital transformation of the management system becomes a response to external pressures and a tool for overcoming structural limitations of the domestic market simultaneously.

For practical management, digital transformation as a factor of competitiveness means reconfiguring three domains in a coordinated way. The first domain is operational excellence, where the task is to use automation, process mining, and analytics to minimize waste, defects, and delays in core processes. The second domain is customer value, where management needs to redesign offerings, channels, and service models to create personalised, transparent, and convenient interactions based on digital tools. The third domain is innovation and business model renewal, where enterprises should experiment with subscription models, platform strategies, data-driven services, and partnerships that are impossible without digital infrastructure. In all three domains, feedback loops between data, analysis and decision-making must be shortened so that the enterprise reacts to market shifts faster than competitors and can initiate changes instead of merely following them (Bharadwaj et al., 2013, p. 476).

Measuring the competitive effects of digital transformation requires the use of appropriate indicators embedded within the management system. Traditional metrics, such as revenue growth, profitability, and market share, remain relevant, but they should be complemented by digital-specific indicators. Among these are the share of digital channels in total sales, the speed of releasing new digital features, the

average time from data capture to management decision, the percentage of processes executed end-to-end without manual intervention, and the level of integration with partners' systems. Systematic monitoring of these indicators enables management to identify bottlenecks, evaluate the returns on digital investments, and adjust the transformation roadmap, thereby linking every significant digital initiative to concrete improvements in competitive position.

In conclusion, digital transformation of the enterprise management system has become a structural condition for long-term competitiveness, rather than a short-term efficiency project. The firm that builds an integrated digital management architecture, aligns strategy and technology, invests in human capital and organisational culture, and establishes continuous learning mechanisms, acquires the ability to adapt to market turbulence and utilise new technological waves earlier than its rivals. In this sense, digital transformation should be interpreted not as a one-time programme, but as an ongoing managerial capability to renew processes, structures, and value propositions based on evolving digital technologies and changing competitive dynamics.

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IMPACT OF DIGITALIZATION ON THE COMPETITIVENESS OF SMALL ENTERPRISES IN UKRAINE

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Nowadays digitalization becomes a key driver of economic development in both developed and emerging countries. For Ukraine, where small enterprises make up a significant portion of the business, the introduction of digital technologies is no longer an optional enhancement but a necessary condition for growth. Under conditions of increasing competition, reduced purchasing power, and unstable market dynamics, small enterprises are forced to adapt rapidly to new technological conditions.

According to the World Bank's 2021 report, the digital transformation of Ukrainian SMEs is one of the most important factors contributing to long-term economic sustainability. Digital technologies, such as digital platforms and e-commerce systems, are increasingly integrated into the operations of small businesses, allowing them to reduce costs, improve internal processes and maintain competitiveness in an unstable environment. For example, cloud tools allow companies to organize remote work and automate routine, while significantly reducing infrastructure costs.

Customer interaction is another field where digitalization provides significant competitive benefits. The EU4Digital Initiative highlights that small enterprises in Eastern Partnership countries, including Ukraine, significantly expand their customer base and increase sales through digital marketing tools and online marketplaces. Social media platforms, targeted advertising and integrated online payment systems have become some of the most effective instruments for Ukrainian businesses with limited marketing budgets. By improving their online presence, small enterprises gain access to new segments of the market and strengthen customer loyalty.

Data analytics also plays a crucial role in increasing competitiveness of small enterprises. Even simple analytical tools available on digital platforms can help enterprises better understand customer behavior, forecast demand and optimize pricing strategies. According to McKinsey Global Institute (2019), companies that employ data-driven decision-making show higher productivity and faster innovation adoption compared to firms that rely solely on traditional methods. For small enterprises in Ukraine, such tools offer an opportunity to enhance operational efficiency with minimal financial investment.

International programs and initiatives also support Ukrainian small enterprises in accelerating digital transformation. Projects implemented by organizations such as the World Bank, EU4Digital and UNDP Ukraine focus on expanding access to digital tools, improving digital infrastructure and supporting the ability of small enterprises to adopt modern technologies. These initiatives help create favorable conditions for the sustainable development of small businesses both locally and internationally.

In conclusion, digitalization has a significant positive impact on the competitiveness of small enterprises in Ukraine. It enhances business productivity, strengthens customer relationships, expands market access and improves the overall adaptability of enterprises to changing market conditions. Small businesses continue to face challenges related to economic instability and limited resources, but the increasing availability of digital technologies and international support programs

provides significant potential for further transformation. Ukraine is increasingly integrated into the global digital economy, so the implementation of digital solutions remains one of the key factors of sustainable growth for small businesses.

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INTEGRATION OF STRATEGIC AND CRISIS MANAGEMENT IN THE CONTEXT OF CONTEMPORARY SOCIO-ECONOMIC CHALLENGES

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In the light of today's challenges, including economic turbulence, political instability, global threats and local crises, effective management requires a combination of long-term strategic thinking and rapid anti-crisis action. Traditionally, strategic management focuses on forecasting, planning and achieving future goals, while crisis management aims to respond quickly to threats and minimise negative consequences. However, in conditions of constant instability, the separate application of these approaches is insufficient, which makes their integration into a single management system relevant.

Strategic thinking is a fundamental element of management that shapes the vision, priorities and directions of an organisation's development. It ensures the ability not only to act within existing conditions but also to create new opportunities for development. At the same time, in crisis situations, the implementation of strategic goals requires constant adaptation to changes in the external environment, which necessitates an anti-crisis component in the management system.

Crisis management is a comprehensive system of management decisions, methods and measures aimed at preventing, minimising and overcoming the negative consequences of crisis situations. Its essence lies in the ability of an organisation to identify threats in a timely manner, assess the level of risk and develop response strategies that ensure stability and continuity of operations. Crisis management is not only a tool for overcoming crises, but also a means of increasing the adaptability, flexibility and competitiveness of enterprises.

For Ukrainian enterprises, the application of crisis management is particularly relevant in connection with military events, the destruction of production and logistics infrastructure, and the exacerbation of economic instability. In conditions of high market turbulence, anti-crisis mechanisms allow for the rapid mobilisation of resources, ensuring economic and personnel security, preserving key business processes, and maintaining stakeholder confidence. The use of modern crisis management tools creates the conditions not only for the survival of enterprises but also for their further recovery and development.

The integration of strategic and crisis management approaches involves the formation of a flexible management model based on the principles of adaptability, systems thinking, proactivity and leadership in conditions of uncertainty. Such a model allows combining strategic vision with operational management decisions, ensuring the organisation's resilience to external and internal threats.

The conceptual model of integrated crisis and strategic management includes several interrelated stages. The first stage is strategic diagnostics, the purpose of which is to identify potential internal and external risks at the stage of forming

strategic goals. To this end, SWOT analysis, PEST analysis, GAP analysis, value chain analysis and stakeholder analysis tools are used. The result of this stage is the formation of a risk map and the identification of critical points in the strategy.

The second stage involves modelling crisis scenario development. Its purpose is to prepare alternative courses of action depending on the type of potential crisis, including economic, reputational, resource or foreign policy crises. The main tools used are scenario analysis, the Delphi method, scenario matrix and trend analysis. The result is the development of adaptive crisis roadmaps.

The third stage is the implementation of anti-crisis protocols that ensure a rapid and coordinated response to the crisis by the organisation. The tools for this stage include business continuity plans, crisis response protocols, and the formation of crisis response teams. The implementation of this stage helps to reduce response time, minimise losses, and preserve key business functions.

The fourth stage is monitoring and feedback, aimed at evaluating the effectiveness of implemented management decisions and their prompt adjustment. For this purpose, KPIs, data analytics and management dashboard systems are used, which allow for continuous improvement of management processes.

Social factors are receiving particular attention in contemporary research on crisis management. Scientific publications indexed in the Scopus database indicate the growing role of leadership, social capital, psychological well-being of staff, and stakeholder trust in crisis situations. Taking social factors into account contributes to the resilience of enterprises, especially in the context of post-war reconstruction, when businesses are forced to adapt to new socio-economic realities.

A bibliometric analysis of scientific publications for 2014–2024 demonstrates a growing interest in crisis management issues, especially during periods of global turmoil, such as the COVID-19 pandemic and the war in Ukraine. Analysis of key clusters of concepts confirms the interconnection between crisis management, social factors, business processes, and organisational resilience.

Therefore, the integration of strategic and crisis management is a prerequisite for ensuring the sustainable development of organisations in today's unstable environment. Combining a long-term vision with operational readiness for crises allows companies to increase their adaptability, reduce risks and create a basis for recovery and further development in the context of socio-economic transformations.

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DIGITAL TAXATION AND GLOBAL ECONOMIC GOVERNANCE: BALANCING INNOVATION, EQUITY, AND SOVEREIGNTY INTHE PLATFORM ECONOMY

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The rapid expansion of the digital economy has outpaced traditional tax frameworks, creating regulatory gaps and revenue losses for governments worldwide. This article examines the emergence of digital taxation as a key issue in global economic governance, focusing on the OECD/G20 Inclusive Framework, unilateral digital services taxes (DSTs), and the challenges of cross-border

enforcement. Through case studies from the European Union, India, and Ukraine, it analyzes how states navigate the tension between innovation, equity, and fiscal sovereignty. The article concludes with recommendations for harmonized tax standards, dispute resolution mechanisms, and inclusive policymaking in the digital age.

Digital platforms have transformed global commerce, enabling borderless transactions, data-driven services, and new business models. However, the tax systems designed for physical goods and fixed establishments have struggled to capture value generated by digital activities. Multinational tech firms often shift profits to low-tax jurisdictions, eroding national tax bases and exacerbating inequality.

In response, governments and international organizations have launched initiatives to reform digital taxation. The OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS) proposes a two-pillar solution: reallocating taxing rights (Pillar One) and establishing a global minimum tax (Pillar Two). Meanwhile, countries like France, India, and Ukraine have introduced Digital Services Taxes (DSTs) to capture revenue from foreign digital firms operating in their markets.

This article explores the economic, legal, and geopolitical dimensions of digital taxation. It assesses the effectiveness of current frameworks, the risks of fragmentation, and the prospects for coordinated reform.

Digital taxation strategies vary widely across jurisdictions. Key models include:

- Digital Services Tax (DST): A turnover-based tax on revenues from online advertising, marketplaces, and user data monetization.

- Equalization Levy: India’s approach to taxing non-resident digital firms without permanent establishment.

- Pillar One (OECD): Reallocates taxing rights to market jurisdictions based on user participation and revenue thresholds.

- Pillar Two (OECD): Introduces a global minimum corporate tax rate to curb profit shifting.

These models aim to address tax base erosion, profit shifting, and jurisdictional mismatch. However, they differ in scope, thresholds, and enforcement mechanisms. Unilateral DSTs risk trade disputes and double taxation, while multilateral frameworks face delays due to political and technical complexity.

Ukraine's 2022 digital tax reform introduced a simplified regime for non-resident e-service providers, aligning with EU standards while preserving fiscal autonomy. The reform boosted compliance and revenue but highlighted challenges in cross-border enforcement and platform registration.

Digital taxation affects multiple stakeholders:

- Governments: Seek to recover lost revenue and assert fiscal sovereignty.

- Multinational firms: Face compliance burdens, legal uncertainty, and reputational risks.

- Consumers: May bear indirect costs through price adjustments and service restrictions.

- Small and medium enterprises (SMEs): Risk competitive disadvantage if tax burdens are unevenly distributed.

Regulatory challenges include:

- Defining digital presence: Establishing nexus without physical establishment.

- Data access and transparency: Ensuring accurate reporting and auditability.

- Dispute resolution: Managing conflicts between source and residence countries.

- Platform compliance: Enforcing registration and payment from non-resident entities.

The EU's proposed Digital Levy and the US opposition to unilateral DSTs illustrate the geopolitical tensions surrounding digital taxation. Without

coordination, fragmented policies may hinder innovation, distort competition, and provoke retaliatory measures.

Digital taxation is a defining issue in 21st-century economic governance. It reflects broader debates about equity, sovereignty, and global coordination in a data-driven economy. While unilateral measures offer short-term solutions, long-term stability requires multilateral consensus and inclusive policymaking.

To advance digital tax reform, stakeholders must invest in:

- Harmonized standards: Aligning definitions, thresholds, and reporting requirements.

- Capacity building: Supporting tax authorities in developing countries with digital tools and expertise.

- Dispute resolution mechanisms: Establishing fair, transparent processes for cross-border conflicts.

- Inclusive dialogue: Engaging SMEs, civil society, and emerging economies in policy design.

Ultimately, digital taxation is not just a technical challenge – it is a test of global cooperation. Balancing innovation with fairness will determine whether the digital economy becomes a driver of shared prosperity or deepening inequality.

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DIGITAL TRANSFORMATION OF LOGISTICS MANAGEMENT AS A KEY FACTOR IN ENHANCING ENTERPRISE SUSTAINABILITY AND COMPETITIVENESS

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The current stage of global economic development is characterised by profound structural transformations caused by globalisation, digitalisation and increasing instability in the external environment. Logistics chains are constantly affected by crises related to geopolitical conflicts, pandemics, disruptions to transport infrastructure and fluctuations in demand on global markets. In such conditions, ensuring the continuity of goods turnover, minimising transaction costs and increasing the flexibility of management decisions are of strategic importance for business entities. It is the digital transformation of logistics management that is gradually becoming a key tool for enterprises to adapt to an unstable economic environment.

Logistics management in the digital economy is seen as a comprehensive system for managing material, information and financial flows, based on the integration of modern digital technologies into all stages of the supply chain. The increasing complexity of logistics processes and higher demands on delivery speed and customer service quality necessitate a transition from traditional management methods to adaptive digital models. In this context, the use of Internet of Things technologies, artificial intelligence, big data, cloud computing and blockchain, which

ensure transparency, efficiency and analytical support for management decisions, is becoming particularly relevant.

Digital technologies are shaping a new architecture for logistics systems, within which there is a constant exchange of information between all participants in the supply chain. Real-time data integration improves the accuracy of demand forecasting, optimises inventory levels, reduces transportation costs and minimises the risk of delivery delays. The use of sensor systems and Internet of Things technologies enables the monitoring of cargo status and control of storage and transportation conditions, which is particularly important for companies in the industrial and commercial sectors. Thus, the digitalisation of logistics contributes to the improvement of business processes and the formation of competitive advantages in the global market.

Big Data analytics tools and artificial intelligence play an important role in the transformation of logistics management. The use of machine learning algorithms makes it possible to process large amounts of information about transport routes, consumer behaviour, seasonal fluctuations in demand and external risks. This creates the conditions for making informed management decisions aimed at optimising costs and improving service levels. Artificial intelligence is also used to automate routine operations, manage warehouse processes and optimise transport logistics, which reduces dependence on the human factor and increases the stability of logistics systems.

Cloud technologies are one of the basic elements of the digital transformation of logistics management. They provide scalability, flexibility and accessibility of information resources, allowing companies to reduce the costs of maintaining their own IT infrastructure. Cloud services enable the integration of inventory, transportation and customer interaction management systems, creating a single information space for coordinating the activities of all participants in the logistics chain. This approach is particularly effective for small and medium-sized businesses,

which gain the opportunity to use high-tech solutions without significant capital investment.

The application of blockchain technologies in logistics management deserves special attention. Their use ensures data immutability and security, increases the level of trust between counterparties, and helps reduce administrative risks. Blockchain allows you to track the origin of goods, monitor the fulfilment of contract terms and automate transactions using smart contracts. As a result, the transparency of logistics processes increases, and the likelihood of disputes between participants in the supply chain decreases.

In times of crisis, instability, and military challenges, digital platforms are becoming the basis for adaptive logistics risk management. They allow for quick adjustments to transport routes, taking into account changes in transport infrastructure and ensuring continuity of supply even when access to certain regions is limited. For Ukraine, the digitalisation of logistics management took on particular importance in 2020–2025, when companies were forced to adapt to the consequences of the pandemic, martial law and disruptions to global supply chains. The introduction of electronic document management, analytical platforms, and transport management systems has helped to reduce order processing times, lower transaction costs, and increase business resilience.

In general, the digital transformation of logistics management has a multiplier economic effect, which manifests itself in increased productivity, enhanced competitiveness of enterprises, and strengthening of the national economy's position in the global market. The formation of integrated digital logistics networks creates conditions for the development of innovative business models, enhanced interaction between market participants, and optimised use of resources. At the same time, the successful implementation of digital initiatives requires significant investment, a high level of cybersecurity, and the unification of digital interaction standards.

Thus, digital technologies are a strategic factor in the evolution of logistics management and ensuring its adaptability in conditions of crisis instability. The

integration of modern digital tools into the logistics chain management system allows companies not only to increase the efficiency of operational processes but also to form sustainable competitive advantages in the long term. The further development of digital logistics management should be based on a comprehensive combination of economic, technological and management solutions aimed at ensuring the stability, flexibility and innovative growth of enterprises in the digital economy.

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PLATFORM ECONOMY: THE BUSINESS MODELS BEHIND UBER, AIRBNB, AND OTHER GIANTS

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Digital platforms have become central actors in contemporary economies, mediating transactions between users while relying on data-driven infrastructures

rather than traditional production assets. Their rise has reshaped competition, labor markets, and regulatory frameworks, prompting scholars and policymakers to reconsider how digital intermediaries create and capture value (De Stefano, 2016). This article analyzes the core mechanisms behind platform dominance and the socio-economic challenges that accompany their expansion.

Platform-based firms scale more efficiently than traditional businesses because they grow by adding users rather than expanding physical assets or labor forces. A platform such as Uber does not need to purchase vehicles or employ drivers directly; instead, it expands by onboarding more participants onto the same digital infrastructure. This results in extremely low marginal costs and rapid global reach.

Traditional firms, by contrast, must invest in production capacity, logistics, and staffing to grow, making expansion slower and more capital-intensive. Platforms scale through data accumulation, algorithmic optimization, and user interactions, giving them a structural advantage in global markets (Kenney & Zysman, 2016).

Network effects, where the value of a service increases as more users join, are central to platform dominance. When more riders join Uber, drivers earn more and wait times decrease, attracting even more riders. Similarly, Airbnb becomes more valuable as more hosts and guests participate. These self-reinforcing dynamics create "winner-take-most" markets in which early leaders consolidate long-term advantages (Rochet & Tirole, 2003; Katz & Shapiro, 1994).

Smaller competitors struggle to reach the critical mass needed to offer comparable convenience or variety. Over time, platforms with the largest user bases become the most efficient, visible, and trusted, making market entry extremely difficult for newcomers. The classification of platform workers, whether as employees or independent contractors, remains one of the most contested issues in digital labor markets. Many platform workers follow platform-defined rules, rely on the platform for access to customers, and have limited control over pricing or working conditions. This has led scholars to argue that they resemble employees and

should receive protections such as minimum wages, social insurance, and collective bargaining rights (De Stefano, 2016).

Platforms, however, emphasize flexibility, arguing that workers value autonomy and the ability to choose when to work. Classifying them as employees could increase operational costs and undermine the flexible model that attracts many workers.

Because the binary categories of “employee” and “contractor” do not fully capture platform work, several countries have explored hybrid classifications that grant certain rights without imposing full employment status. This debate reflects a broader challenge: labor laws designed for industrial economies struggle to regulate digital, algorithmically mediated work.

Platform companies monetize user data by analyzing behavior, preferences, and interactions to optimize matching algorithms, personalize recommendations, and refine pricing strategies. Some platforms also sell aggregated insights or use data to enhance targeted advertising. This creates significant economic value but raises ethical concerns related to privacy, surveillance, and power asymmetries.

Users often lack transparency regarding how much data is collected, how it is used, or who gains access to it. Platforms accumulate vast datasets that provide competitive advantages and influence over markets, while users have limited control over their digital footprints. These dynamics fuel debates about data rights, algorithmic accountability, and the governance of digital infrastructures.

Platform companies face regulatory challenges because their cross-border, digital nature does not fit neatly into traditional legal frameworks. Regulatory responses vary widely:

- Labor regulation: Some jurisdictions question whether gig workers should be treated as employees.

- Consumer protection: Ride-hailing, short-term rentals, and online marketplaces face safety and quality standards.

- Data protection: Laws such as the GDPR impose strict rules on privacy, data storage, and algorithmic transparency.

- Competition policy: Authorities worry about market dominance, data monopolies, and anti-competitive behavior.

Local governance: Platforms often clash with municipal rules, such as zoning laws for Airbnb or taxi licensing for Uber. These regulatory tensions reflect the mismatch between fast-moving digital innovation and slower, jurisdiction-bound legal systems. Platforms influence competition by creating environments where size and connectivity matter more than physical assets. Network effects, data accumulation, and user lock-in encourage markets to "tip" toward one or two dominant players. As platforms grow, they can set terms for workers, suppliers, and consumers, further entrenching their power (Khan, 2017).

This combination of structural advantages leads to highly concentrated markets where a few platforms shape the competitive landscape and influence entire industries. Despite the dominance of global giants, smaller local platforms can succeed under certain conditions:

- Deep local knowledge of cultural norms, regulations, and consumer preferences.

- Supportive regulatory environments, such as data-localization laws or licensing restrictions on foreign platforms.

- Specialization in niche markets overlooked by global firms.

- Higher levels of trust in local companies.

- Partnerships with local businesses or governments that enhance visibility and legitimacy.

Local platforms thrive when they leverage proximity, specialization, and regulatory advantages to differentiate themselves from global competitors (Cutolo & Kenney, 2021).

The platform economy is built on digital marketplaces that connect users rather than producing goods or services directly. These businesses scale rapidly through

data, algorithms, and network effects, creating winner-take-most markets dominated by a few global players. Their rise raises new challenges around labor classification, data governance, competition, and regulation, areas where traditional laws struggle to keep pace. Ultimately, platform giants reshape industries by transforming how value is created, exchanged, and governed in the digital age.

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IMPACT OF MARTIAL LAW ON UKRAINE'S ELECTRIC VEHICLE MARKET: RESILIENCE AND GROWTH IN A TIME OF CONFLICT

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The Ukrainian electric vehicle (EV) market is a notable example of economic resilience and counterintuitive growth during the ongoing full-scale Russian invasion since February 2022. This expansion, which makes Ukraine's EV sector one of the fastest-growing in Eastern Europe despite operating under martial law, defies traditional economic predictions of market contraction during conflict. This unique phenomenon provides valuable insights for crisis-driven market adaptation, making it a crucial subject for economic analysis.

Prior to Russia's full-scale invasion, Ukraine had established itself as a regional leader in the adoption of electric vehicles. By the end of 2020, the country's EV fleet exceeded 20,000 units, representing an annual increase of more than 50% (Kyiv School of Economics, 2024). The government implemented supportive policies, including zero import duties for electric vehicles and value-added tax (VAT) exemptions, creating favorable conditions for market development. Ukraine's charging infrastructure has developed rapidly, achieving a ratio of approximately one charging station for every four electric vehicles, with 23% of stations providing fast charging capabilities (UkraineInvest, n.d.).

The outbreak of war in February 2022 created severe disruptions across Ukraine's automotive sector. Ukrainian enterprises, particularly those in western border regions, served as major suppliers of wiring harnesses to European Union automakers, with companies including Fujikura, Nexans, Kromberg & Schubert, Yazaki, and Sumitomo operating production facilities. These plants manufactured electrical components for Opel, BMW, Mercedes-Benz, Volkswagen, Audi, Škoda, Porsche, and Bentley (Automotive Market Research Institute, n.d.). The invasion led to production suspensions, resulting in supply chain disruptions throughout the European automotive industry and reducing annual global vehicle production by

approximately 1.5 million units (Business & Human Rights Resource Centre, 2022).

Ukraine also played a crucial role in global metal and inert gas supplies, which are essential for automotive manufacturing. The country accounted for 29% of steel exports to the European Union and provided 25% of the world's neon supplies, which are necessary for semiconductor production (Automotive Market Research Institute, n.d.). The conflict disrupted these supply chains, contributing to increased prices for aluminum, palladium, and nickel, ultimately raising new vehicle costs globally. These disruptions exemplify broader patterns observed in conflict-affected automotive markets, where geopolitical events significantly impact the trajectories of energy transitions (Bednarski et al., 2023).

Despite these challenges, Ukraine's electric vehicle market demonstrated exceptional resilience. In the first eight months of 2023, Ukraine registered over 54,800 electric vehicles, exceeding the total sold in 2022. August 2024 marked a record month with 6,714 new EV registrations, representing an 80% increase compared to August 2023. Regional growth proved particularly strong in western Ukraine, with Volyn region experiencing EV registration growth exceeding 13% (UNECE, n.d.). By 2024, electric vehicles accounted for 15.1% of new vehicle sales in Ukraine, nearly matching the European Union's average of 15.4% (Automotive Market Research Institute, n.d.).

Several interconnected factors drove this counterintuitive growth pattern. First, rising conventional fuel prices created favorable economics for electric vehicle ownership. Government increases in excise taxes on liquefied petroleum gas (LPG) in September 2024 pushed prices to record levels, improving the relative cost-benefit ratio for electric vehicles (UNECE, n.d.). The spike in Ukraine's EV market was fueled by the approaching expiration of tax benefits (reintroducing a 20% VAT from January 1, 2026), prompting consumers to accelerate purchases to avoid anticipated 20-40% price hikes. Paradoxically, infrastructure attacks did not deter adoption; consumers viewed EVs as providing greater energy security through decentralized charging, accelerating the shift to electric mobility.

Infrastructure development proceeded despite wartime conditions. The Ukrainian charging station market exhibited a strong correlation with the growth of the EV market, with increased demand for electric vehicles driving a proportional expansion in charging infrastructure (Zakharchenko, Kuvaieva, Lutsenko, & Pilova, 2025). Charging stations offer additional benefits to power system operators by enabling load balancing during both peak and off-peak periods, thereby improving overall grid stability through vehicle-to-grid capabilities (Davydov & Stafidov, 2023). Ukraine maintained cost advantages in charging infrastructure operations, with electricity costs for EV charging approximately seven times lower than in Germany, making Ukraine the most affordable country in Europe for electric vehicle operation (UkraineInvest, n.d.).

Market composition reflected Ukraine's unique economic position. The vast majority of registered vehicles consisted of used imports from the United States and European countries rather than new vehicle sales. This pattern reflects broader characteristics of automotive markets in middle-income countries, where used vehicle imports dominate due to price sensitivity. Popular models included the Nissan Leaf, Tesla Model 3, and Volkswagen ID.4, with Tesla and Volkswagen commanding significant market share among imported vehicles (Yuzyk, 2022).

The war created both challenges and opportunities for the sector to adapt. Energy infrastructure attacks by Russian forces raised concerns about charging reliability; however, the development of distributed generation capacity and the integration of renewable sources provided partial mitigation (UNECE, n.d.). The absence of coordinated standards for charging station installation created grid management challenges in areas with older electrical infrastructure. Population displacement due to war reduced the potential customer base, while mobilization affected both consumer demand and employment in the automotive sector.

Looking ahead, Ukraine's EV market is facing evolving conditions. The European Union has outlined ambitious targets, planning to install approximately 6.8 million public charging stations by 2030 and investing €280 billion in charging

infrastructure, grid modernization, and renewable energy capacity (UkraineInvest, n.d.). Ukraine's integration with European automotive and energy markets presents opportunities for infrastructure development aligned with EU standards, particularly in relation to the requirements of the Trans-European Transport Network (TEN-T) corridor.

However, the sector operates within a complex competitive landscape. European automotive manufacturers face intensifying competition from Chinese electric vehicle producers, which could lead to four potential scenarios by 2030: maintaining cutting-edge European leadership, slow electrification with Chinese market dominance, overdependence on Chinese technology by Europeans, or sanctions-driven supply chain disruptions (European Alternative Fuels Observatory, 2024).

The performance of the Ukrainian electric vehicle market under martial law demonstrates several important principles of crisis adaptation. First, supportive regulatory frameworks can sustain market growth even under highly adverse conditions. Second, economic pressures such as rising conventional fuel costs can accelerate technological transitions that might otherwise occur more gradually. Third, infrastructure resilience through decentralization and domestic production capacity enhances sector stability in the face of external shocks. Fourth, consumer behavior adapts pragmatically to new realities, with economic considerations often outweighing war-related uncertainties.

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IMPACT OF MARTIAL LAW ON PJSC ZAPORIZHSTAL: CHALLENGES AND ADAPTATION STRATEGIES

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PJSC Zaporizhstal is one of Ukraine's largest metallurgical enterprises, located in the city of Zaporizhzhia, which plays a crucial role in the region's and the country's production and economic activities. The company is part of the Metinvest holding (SCM group) and is a key producer of ferrous metals – cast iron, steel, hot-rolled and cold-rolled products.

Under martial law, Ukraine's metallurgical industry has suffered significant losses; therefore, an analysis of the performance of PJSC Zaporizhstal is highly relevant as an example of how the industry is adapting to the war's conditions.

The company has a powerful production base: blast furnace, steelmaking and rolling shops. It manufactures a wide range of products in accordance with international standards (DSTU, GOST, EN, ASTM), supplying the domestic market and exporting to the EU, the Middle East, Asia and Africa. PJSC Zaporizhstal operates on the basis of an Integrated Management System for Quality, Occupational Health and Safety, Environment and Energy Efficiency (IMS) (Zaporizhstal, n.d.). The company has a code of ethics (Metinvest Group, n.d.) developed by Metinvest Group in 2013. It defines moral and ethical standards, corporate culture and principles of employee conduct (Zaporizhstal, n.d.).

Following the destruction of the Azovstal and Ilyich steelworks, PJSC Zaporizhstal remained the largest operating steelmaking enterprise of the *Metinvest Group* in Ukraine. The Russian Federation's military aggression had a negative impact on the steelworks' production, logistics, economic performance and labour resources. Key indicators illustrate the scale of the disruption:

- in 2022, production fell by more than half due to supply chain disruptions, logistics issues, and staff shortages;
- in 2023–2024, the plant resumed operations at 70% capacity: pig iron

production increased by 35%, steel by 66% and rolled products by 56% compared to 2022;

- revenues fell significantly: from a profit of UAH 17 billion in 2021, the company posted a loss of UAH 2.3 billion in 2023, with liabilities growing by 40%.

The war disrupted maritime logistics, forcing the plant to switch to more expensive rail and road routes. This increased production costs and complicated exports. At the same time, the company reoriented itself towards European markets, adapting its products to new standards.

Despite the crisis, investment in production increased by more than 140% (from UAH 500 million in 2022 to UAH 750 million in 2023 and about UAH 1 billion in 2024) (GMK Centre, 2024; Tarasovskyi, 2024). The primary capital investments are focused on repairing blast furnaces, modernizing the sintering plant, and implementing energy-efficient technologies and safety programs.

In terms of human resources, the war has led to a reduction in staff from 10,000 (2021) to 8,000 (2023) (Ptakhovska, 2024). Some employees have been mobilised into the Armed Forces of Ukraine, while others have been evacuated. The company is actively employing displaced individuals, particularly those from Mariupol factories (Ptakhovska, 2024), and is conducting retraining programs. Still, the plant has a substantial labour shortage (Katyshev, 2024).

Despite significant losses, PJSC Zaporizhstal remains a strategic enterprise in Ukraine and the primary steel producer of the *Metinvest Group*. The company has demonstrated resilience by investing in modernization, technological upgrades, safety and social support for employees. At the same time, instability, rising costs and the risks of military action remain the main challenges for the plant's future operations. Thanks to its adaptability, corporate culture and compliance with international management standards, PJSC Zaporizhstal remains an example of an effective industrial strategy in wartime conditions.

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THE ROLE OF ECONOMIC SCIENCE IN MODERN SOCIETY

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Economic science plays a crucial role in understanding the functioning of modern society. As global markets become increasingly interconnected and as digitalization continues to transform economic relations, the need for comprehensive economic research is greater than ever. Economic science helps explain how resources are produced, distributed, and consumed, and provides tools for making informed decisions at both the micro- and macroeconomic levels.

One of the most significant functions of economic science is the analysis of market behavior. Modern markets are dynamic systems influenced by numerous factors, including technological development, consumer preferences, political decisions, and global economic trends. Economic research allows scholars and policymakers to identify key drivers of economic growth, study price mechanisms, and evaluate the effects of supply and demand fluctuations. For example, the rapid expansion of the digital economy has changed traditional production models and created new forms of employment, requiring updated analytical approaches from economists.

A further important function of economic science is its influence on policymaking. Governments rely on economic theories and empirical research when designing fiscal, monetary, and social policies. Well-designed economic policies help stabilize national economies, stimulate growth, reduce unemployment, and promote sustainable development. For instance, the use of counter-cyclical fiscal policies has proven effective in mitigating the negative effects of economic crises. Economists also assess the long-term consequences of government interventions, ensuring that policies are both efficient and socially responsible.

Economic science also contributes to solving global challenges such as inequality, climate change, and resource scarcity. Environmental economics has become increasingly important as countries seek to transition to greener economies.

This field studies the relationship between economic activities and the environment, offering solutions such as carbon taxes, renewable energy incentives, and sustainable resource management strategies. These measures help balance economic growth with ecological preservation, ensuring a more sustainable future.

In addition, economic science plays a vital role in international relations. Globalization has made national economies deeply interconnected, meaning that economic events in one country can affect regions across the world. International economics examines global trade, capital flows, exchange rates, and economic integration. Understanding these processes is essential for developing effective trade agreements and promoting economic cooperation. For developing countries, economic research provides insights into strategies for attracting foreign investment and enhancing competitiveness in the global market.

Technological progress has also influenced the development of economic science. Big data, artificial intelligence, and advanced statistical tools allow economists to conduct more accurate analyses and make more reliable predictions. Modern economic modeling incorporates complex variables and large datasets, which significantly improves the quality of research. These innovations have expanded the possibilities of economic science, enabling experts to study consumer behavior, market trends, and financial risks in greater detail.

All things considered, economic science remains a cornerstone of modern society. It helps explain complex processes, evaluate government policies, and address global challenges. As the world continues to change rapidly, economic research will play an even more significant role in shaping a stable, prosperous and sustainable future. By understanding economic principles and applying them responsibly, societies can ensure balanced development and improve the quality of life for present and future generations.

Moreover, economic science also plays a crucial role in understanding the functioning of financial markets, which represent the backbone of modern economies. Financial economics examines how individuals, institutions, and

governments allocate financial resources over time under conditions of risk and uncertainty. This field provides insight into how stock markets operate, how interest rates are determined, and how financial instruments such as bonds, derivatives, and currencies influence global economic stability. The study of financial crises, including the 2008 global downturn, highlights the importance of financial regulation, risk assessment, and transparency. Economists working in this area help policymakers create mechanisms to prevent future crises, enhance investor protection, and maintain trust in financial systems.

Moreover, economic science is deeply connected to the study of entrepreneurship and innovation. Entrepreneurs play a vital role in economic development by introducing new products, technologies, and business models. Innovation-driven economies tend to achieve higher productivity and long-term growth. Economists analyze which conditions encourage entrepreneurship, such as low administrative barriers, access to capital, property rights protection, and competitive markets. These insights help governments design policies that stimulate start-up creation, support research and development, and promote digital transformation. Innovation clusters and technological hubs, such as Silicon Valley, demonstrate how economic principles can guide regional development and global competitiveness.

Another important aspect is the role of economics in public welfare and social policy. Welfare economics evaluates how resources and income are distributed in society and identifies strategies for improving overall well-being. Economists assess the effectiveness of healthcare systems, education programs, social security, and public housing. By analyzing cost–benefit ratios, economists determine which policies deliver the greatest social return. For example, investments in early childhood education have been shown to yield long-term economic benefits through higher productivity and lower crime rates. Welfare economics thus helps decision-makers allocate public funds in ways that maximize social welfare and reduce inequality.

Economic science is also essential for analyzing global supply chains and international production networks. Modern goods from smartphones to automobiles are assembled through complex chains involving numerous countries. Economists study how global shocks, such as pandemics or geopolitical conflicts, disrupt these networks and affect trade, production, and employment. This research is particularly important today, as many countries aim to strengthen their economic resilience by diversifying supply chains, increasing domestic production capacity, and enhancing logistical infrastructure. Understanding global supply chains also helps businesses optimize costs, reduce delays, and remain competitive.

Furthermore, development economics is a key field that addresses the challenges faced by low-income and transitioning economies. It examines issues such as poverty reduction, economic growth strategies, institutional development, and access to education and healthcare. Economists in this field explore why some countries progress rapidly while others struggle with stagnation. They analyze the role of foreign aid, microfinance, technological adoption, and structural reforms. Development economics also emphasizes the importance of good governance, transparency, and effective public administration in achieving sustainable growth. These insights guide international organizations such as the World Bank and the United Nations in designing development programs.

Another rapidly expanding branch is digital economics, which investigates how digital technologies transform economic relationships. The rise of e-commerce, online banking, digital currencies, and platform-based businesses has reshaped traditional economic models. Digital economics studies data as a new form of capital, the role of algorithms in shaping consumer behavior, and the economic implications of artificial intelligence. This field also explores cybersecurity, privacy, and digital competition, which are becoming critical issues in the global economy. Economists help regulate digital markets to ensure transparency, fair competition, and consumer protection in the digital age.

Finally, economic science provides essential tools for long-term forecasting and scenario planning. Economists develop models to predict economic trends, evaluate potential risks, and support strategic decision-making. Governments and businesses rely on these forecasts to design budgets, investment strategies, and national development plans. As global uncertainty continues to rise, high-quality economic forecasting becomes increasingly valuable for maintaining stability and adapting to future challenges.

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THE ESSENCE OF COMPETITION: FORMS AND METHODS OF COMPETITIVE STRUGGLE

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Competition is a struggle for the most favorable conditions of production and sale of goods and services, aimed at obtaining maximum profit.

In the event of a conflict of interests among individual producers or sellers of goods and services, each of them tries to assert their advantages and secure the most favorable and stable position, including by weakening or even bankrupting competing enterprises.

The essence of competition is most fully revealed in its functions. It contributes to:

- the expansion of production scales by enterprises, the increase of labor productivity, and, as a result, the reduction of production costs per unit of output, and consequently, the price;

- the saving of resources (natural, material, labor, financial, etc.);

- the implementation of scientific and technological achievements in production, which leads to increased labor productivity;

- the improvement of product quality and consumer services (including after-sales service);

- the creation of conditions for enterprise bankruptcies, and on this basis, an increase in unemployment;

- the emergence of economic crises;

- the intensification of the process of differentiation among producers, i.e., the enrichment of some and the impoverishment of others;

- the monopolization of the economy.

It can be concluded that competition has both positive and negative aspects. Their balance depends on the types and forms of competition and the impact of state regulatory activities.

The essence of competition, including its functions, changes in the process of evolution of the economic system.

Free (or pure, perfect) competition

It is characterized by a large number of competing producers and buyers, as well as free access for producers to any type of activity. Under these conditions, the price formation process occurs as a result of free (without any restrictions) and spontaneous interaction of demand, supply, and prices, which implies the self-regulation of the economic system and the price-based nature of competitive struggle. Producers focus on satisfying consumer needs. An ideal model in this scheme is a situation in which the consumer is always right, and any form of discrimination against the consumer is completely excluded, meaning the existence of a kind of consumer “dictate” over the seller.

In free competition, no firm can influence the market price. Free competition takes the form of intra-industry and inter-industry competition.

Intra-industry competition is the struggle between producers operating within the same sector of the economy and producing identical or interchangeable products.

The main method of competition under such conditions is the reduction of production costs. To ensure that this reduction does not lead to a decrease or loss of profit, enterprises must implement new scientific and technological achievements in production, improve forms of organization of production and labor, introduce new forms and systems of remuneration, and so on.

Another important method of competitive struggle in intra-industry competition is the improvement of product quality. This allows companies to slightly increase prices compared to competitors if the quality of their products is lower.

Inter-industry competition is competition among producers operating in different sectors of the economy and producing heterogeneous types of products. Due to varying production conditions across industries, entrepreneurs achieve different output volumes even with the same capital expenditures. Therefore, producers who receive lower profits try to invest their capital in industries where profits are higher. This is achieved through the re-profiling of production, the replacement of shares in less promising industries by buying and selling shares in more promising ones, and other similar methods.

Imperfect (Monopolistic) Competition

This type of competition occurs between large companies and small to medium-sized firms. It involves the struggle for market monopolization, sources of raw materials and energy, obtaining government contracts and loans, and ownership of intellectual property (patents, licenses, etc.). Its most important features are the establishment of monopolistically high prices and the acquisition of monopolistically high profits on this basis.

To achieve such profits, large monopolist companies use advertising, expand the range of after-sales services, improve product quality and its utility, and so on. In

general, a monopolist company cannot increase prices indefinitely, as this leads to a reduction in demand for its products and, consequently, a decrease in sales volume. Price competition is the struggle between producers for consumers by reducing production costs and lowering prices for goods and services without significantly changing their quality or assortment.

Entrepreneurs often resort to price manipulation (setting low prices until a product captures the market, then significantly raising them), price concessions, seasonal sales, etc. An important feature of price-based monopolistic competition is price discrimination (for example, the dominance of transport companies in shipping perishable agricultural products), where the same product or service is sold to different groups of buyers at different prices.

Non-price competition is the struggle between producers for consumers through the implementation of scientific and technological progress in production, which leads to improved product quality and a wider range of products.

Moreover, to capture larger markets, companies extend warranty periods, provide credit to buyers, and so on. Non-price competition mainly occurs under an oligopolistic monopoly structure (i.e., the control of production and sales of a certain type of product by a few large companies). Additionally, it is characterized by a certain price stability (since prices are coordinated among several powerful companies), which has taken the form of “price leadership.” To prevent other enterprises from entering this market, companies engage in patenting and licensing new inventions, threaten to introduce new production capacities, and saturate the markets with goods, among other strategies. Non-price competition more fully reflects the interests of consumers.

A form of imperfect competition is unfair competition, which is carried out mainly by non-economic methods (bribery of officials, industrial espionage, secret agreements on unified pricing policies, and even sabotage against competitors).

Therefore, it can be concluded that competition is a driving force in the economy, ensuring efficiency, innovation, and consumer satisfaction. The balance

between positive and negative effects of competition depends on the type, form, and regulatory environment. Understanding these mechanisms is crucial for both producers and policymakers to foster economic growth and protect consumer interests.

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ADAPTIVE LOGISTICS MODELS FOR MAINTAINING UNINTERRUPTED COMMODITY FLOWS IN CONDITIONS OF CRISIS-INDUCED INSTABILITY

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The current economic realities, shaped by military conflicts, global crises and geopolitical instability, necessitate a rethinking of the role of logistics as a system-forming element of socio-economic stability. In a state of martial law, when traditional supply chains are undergoing destructive changes, and the transport and infrastructure capacity of the economy is significantly reduced, ensuring uninterrupted trade becomes strategically important not only for the functioning of the market, but also for maintaining social stability, employment and meeting the

basic needs of citizens. Under such conditions, logistics ceases to be solely a tool for optimising costs and transforms into a factor of economic viability and an element of national security.

Disruptions to traditional supply chains, restrictions on access to resources, destruction of infrastructure, and changes in consumer behaviour are shaping a new paradigm for the functioning of logistics systems. Companies are forced to adapt to a high level of uncertainty, reorient transport routes, review inventory structures and implement alternative supply schemes. In this context, ensuring the continuity of commodity flows requires a comprehensive approach that combines strategic, tactical and operational decisions aimed at reducing the vulnerability of logistics systems to external shocks and increasing their adaptability.

A systematic approach to the organisation of logistics processes, which involves the integration of production, transport, warehousing, financial and information flows into a single adaptive model, is of particular importance. This approach allows logistics to be viewed not as a set of isolated operations, but as a complex mechanism that interacts with macroeconomic trends, government policy, technological innovations and social processes. It is the level of coordination between these components that determines the ability of enterprises and the national economy as a whole to maintain stable trade turnover in crisis conditions.

In conditions of instability, companies are increasingly abandoning centralised logistics models in favour of decentralised and multi-channel supply systems. Diversification of suppliers, creation of distributed warehouse networks and use of alternative transport corridors reduce the risk of critical supply disruptions. Flexible inventory management, focused on prioritising essential goods, optimising product ranges and reducing losses in storage and distribution chains, is becoming an important tool for improving logistics resilience.

The digitisation of logistics processes plays a key role in improving the efficiency of goods flow management in conditions of high uncertainty. The use of big data analytics, machine learning algorithms, and intelligent demand forecasting

systems allows for rapid response to changes in market conditions, optimisation of transport routes, and improved planning accuracy. The introduction of automated real-time goods tracking systems helps to increase the transparency of logistics operations and reduce operational risks, which is particularly important in crisis and war conditions.

An equally important aspect of ensuring uninterrupted trade is coordination between businesses, government agencies and international organisations. In conditions of limited resources and increased risks, effective logistics solutions often require the involvement of public-private partnership mechanisms, simplification of customs procedures and the use of special regulatory regimes for the import and transit of critically important goods. Such interaction not only stabilises supply chains but also supports socially significant areas of economic activity.

Adapting to changes in consumer behaviour plays a special role in shaping sustainable logistics models. The transition to hybrid retail formats that combine physical retail outlets, e-commerce and delivery services requires a corresponding review of logistics solutions, particularly in terms of last-mile delivery. The use of temporary pick-up points, mobile retail outlets and personalised approaches to customer service allows goods to remain accessible even when the population's mobility is restricted.

In conditions of armed aggression and large-scale infrastructure losses, it is advisable to apply certain principles of military logistics in the civilian sector. Flexible routing, modular storage facilities, mobile logistics hubs, and situational management systems allow for rapid response to changing circumstances and minimise the consequences of disruptions to traditional supply channels. Integrating such approaches into commercial logistics systems helps to maintain the functionality of critical sectors of the economy and forms the basis for post-crisis recovery.

In general, the effectiveness of modern logistics systems in crisis conditions is determined by their ability to quickly adapt, integrate innovative technologies, and

coordinate actions between all participants in the supply chain. Classic logistics models focused on stability and cost minimisation prove insufficient in conditions of instability and high risk. Instead, adaptive, digitalised and integrated logistics solutions that ensure not only economic efficiency but also social sustainability are becoming a priority.

Thus, the development of logistics models capable of functioning in conditions of multidimensional instability is a strategic necessity for the modern economy. Logistics is transforming from a supporting function into a key tool for maintaining continuous trade, employment and social stability. In the context of military threats and post-war reconstruction, it is adaptive logistics approaches that combine flexibility, digitalisation and cross-sectoral coordination that form the basis for the restoration of economic activity and Ukraine's integration into global economic processes.

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INNOVATION MANAGEMENT AS A KEY FACTOR IN THE DEVELOPMENT OF MODERN ENTERPRISES

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The modern world is characterised by rapid economic development, globalisation and increased competition at all levels. In such conditions, it is critically important for companies in any industry to maintain competitiveness and seek new approaches to management. One of the key tools capable of ensuring stable development and growth in efficiency is innovation management. Its importance cannot be overestimated, as innovation permeates all areas of a company's operations, covering scientific, technical, socio-economic and managerial activities. The introduction of innovation management allows for the optimisation of production processes, improvement of product and service quality, rational use of resources and strengthening of the company's market position.

Recent scientific research shows considerable interest in the issue of innovation management among Ukrainian and foreign scientists. For example, P. Mykytiuk and colleagues emphasise that innovation management is a management system that has a comprehensive impact on the development of enterprises and the economy as a whole, combining state regulation, management activities and the risks of innovative activity (Mykytiuk, 2019). The research by T. Bondar and co-authors focuses on the historical development of innovation management, its goals and priorities, which allows enterprises to plan and implement innovation processes more effectively (Bondar, 2022). In their work, Zh. Harbar and K. Maiborodiuk compare modern strategies for innovative development and define the essence of innovation management as a key factor in competitiveness (Harbar & Maiborodiuk, 2021). Yu. Zaika, studying the problems of implementing innovations in crisis conditions, emphasises the need to adapt management strategies to changes in market conditions (Zaika, 2022).

Innovation management encompasses various areas of activity covering socio-economic, technical, social, product and process components. The socio-economic area is aimed at optimising resources, increasing productivity and ensuring the profitability of the enterprise. The technical area involves the use of the latest technologies to improve production quality and increase process efficiency. The social aspect covers increasing motivation, qualifications and the overall level of employee satisfaction, which directly affects the productivity and creativity of the team. The product direction involves improving the quality of products and services, expanding the range and meeting market needs. The process direction is aimed at optimising internal business processes, reducing costs and increasing overall management efficiency.

The goals of implementing innovation management determine the strategic vector of the enterprise's development and include increasing productivity, optimising production processes, ensuring operational safety, improving personnel and financial management, and increasing market competitiveness. Choosing an effective strategy for innovative development is a key factor in the successful operation of a company. The main strategies include an offensive strategy, which involves the creation of innovative products and technologies; a defensive strategy aimed at maintaining competitive positions; an imitation strategy based on the use of licences and borrowings; a dependent strategy, where subsidiaries participate in the implementation of the parent company's innovations; a traditional strategy focused on improving existing products; an 'opportunity' strategy that allows for quick responses to new market opportunities; and a mixed strategy that combines different approaches. In modern management, special attention is paid to the 'blue ocean' strategy, which allows you to create new markets free from competition and ensure high profits through innovative solutions that distinguish the company from its competitors. The product direction involves improving the quality of products and services, expanding the range and meeting market needs. The process direction is

aimed at optimising internal business processes, reducing costs and improving overall management efficiency.

The practice of implementing innovation management demonstrates the effectiveness of such strategies in the activities of well-known companies. For example, LG Electronics successfully implements the ‘blue ocean’ strategy, integrating innovation into marketing, human resource management and logistics, which allows the company to maintain its leading position in the global electronics market. Another example is Whirlpool, which has implemented comprehensive changes in its internal processes, improving its products, staff training system and methods for evaluating the effectiveness of innovations, which has led to increased competitiveness and cost optimisation. The process direction is aimed at optimising internal business processes, reducing costs and improving overall management efficiency.

At the same time, Ukrainian enterprises face certain problems in implementing innovation management. The main ones are a low level of innovation culture, limited access to modern information and technologies, insufficient qualifications of management personnel, preservation of traditional approaches to management, and the lack of significant effect from the innovations implemented. To overcome these problems, state support, the creation of innovative infrastructure, technology parks and technoparks, as well as the introduction of international experience in innovation management, are critically important.

Therefore, innovation management is a key factor in improving the competitiveness of enterprises. Its effectiveness is determined by the correct identification of priorities, directions and goals, which allows optimising production and management processes, improving the quality of products and services, and ensuring the sustainable development of the company. The implementation of modern innovation development strategies, such as the ‘blue ocean’ strategy, allows enterprises not only to maintain their competitive positions but also to create new markets and increase profitability. Ukrainian companies have significant potential

for the development of innovation management, which can be realised through the improvement of managers' qualifications, the creation of appropriate infrastructure and the integration of advanced international experience. Further research in this area could contribute to more effective implementation of innovation strategies, assessment of their effectiveness, and optimisation of state policy to support innovation in Ukraine.

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Parkhomenko A. V.

THE RISE OF NEOBANKS AND THE FUTURE OF TRADITIONAL BANKING

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Over the past decade, the global financial sector has undergone a profound structural transformation driven by the rapid expansion of financial technologies and

the increasing digitalisation of banking services. Among the most influential developments is the emergence of neobanks – fully digital, mobile-first financial institutions that operate without physical branches and rely on advanced technological infrastructures to deliver fast, efficient, and customer-centric financial services. By leveraging cloud computing, artificial intelligence, open banking frameworks, biometric security systems, and real-time payment technologies, neobanks challenge the longstanding dominance of traditional banks and reshape customer expectations regarding accessibility, transparency, and financial autonomy. According to recent industry analyses, the global neobanking market continues to demonstrate robust growth, supported by a sustained increase in demand for low-cost financial products and frictionless digital interfaces (DiAntonio, 2024).

Among the most prominent global examples is Revolut, a UK-based neobank that has expanded its user base to more than 40 million customers worldwide by 2025. Its success illustrates how digital-only platforms can transform personal finance management by offering multi-currency accounts, commission-free foreign exchange, automated budgeting tools, and seamless international payments. Revolut's model represents the new paradigm of banking, where competitiveness is rooted not in branch networks but in technological agility, product personalisation, continuous innovation, and user-experience optimisation. This evolution has stimulated similar developments in emerging markets (O'Neill and Langbridge, 2025).

In Ukraine, Monobank – the country's first mobile-only bank – has rapidly become a national fintech phenomenon by providing intuitive interfaces, instant credit decisions, gamified financial tools, and exceptional customer support facilitated through in-app chat services (Kapliar, 2023). The parallel rise of Revolut and Monobank demonstrates that the neobanking model is not confined to advanced economies but is capable of flourishing in diverse regulatory, technological, and cultural contexts.

Despite their notable achievements, neobanks face persistent challenges that shape their long-term prospects. These include regulatory uncertainties, cybersecurity threats, dependence on partnering banks for deposit insurance and payment infrastructure, and the difficulty of achieving sustainable profitability in highly competitive markets. At the same time, traditional banks – although initially slow to adapt – have accelerated their digital transformation strategies, integrating open-banking APIs, launching mobile-first services, and investing in artificial intelligence to maintain relevance. Consequently, the relationship between neobanks and incumbent banks is no longer strictly adversarial; rather, it reflects a complex environment of competition, collaboration, and convergence (Sabbani, 2024).

These trends illustrate a fundamental reconfiguration of the contemporary banking environment. Neobanks have introduced new standards of speed, transparency, and user-centricity, compelling traditional institutions to reassess long-established operational models and adopt more flexible, technology-driven strategies. At the same time, persistent regulatory, infrastructural, and security constraints highlight the complexity of adapting these models within diverse economic and institutional contexts. Understanding the scale and direction of these developments requires a closer examination of current market dynamics, emerging technological drivers, and the global distribution of neobanking growth, which together define the trajectory of the sector's ongoing transformation.

The global neobanking sector has demonstrated exceptionally rapid expansion during the past five years, reflecting profound shifts in consumer financial behavior, technological capabilities, and regulatory frameworks. According to industry data for 2024, the neobanking market reached $176.05 billion, and is projected to grow to $261.4 billion in 2025, before accelerating to $1.219 trillion by 2029, reflecting an extraordinary compound annual growth rate (CAGR) of 47–48%. This exponential trajectory positions neobanking as one of the fastest-growing segments of the global financial services industry. The dynamics behind this expansion highlight a combination of structural drivers: the widespread digitalisation of

financial services, increasing smartphone penetration, the global shift toward cashless economies, and intensified demand for personalised, low-cost, and real-time financial products (The Business Research Company, 2025).

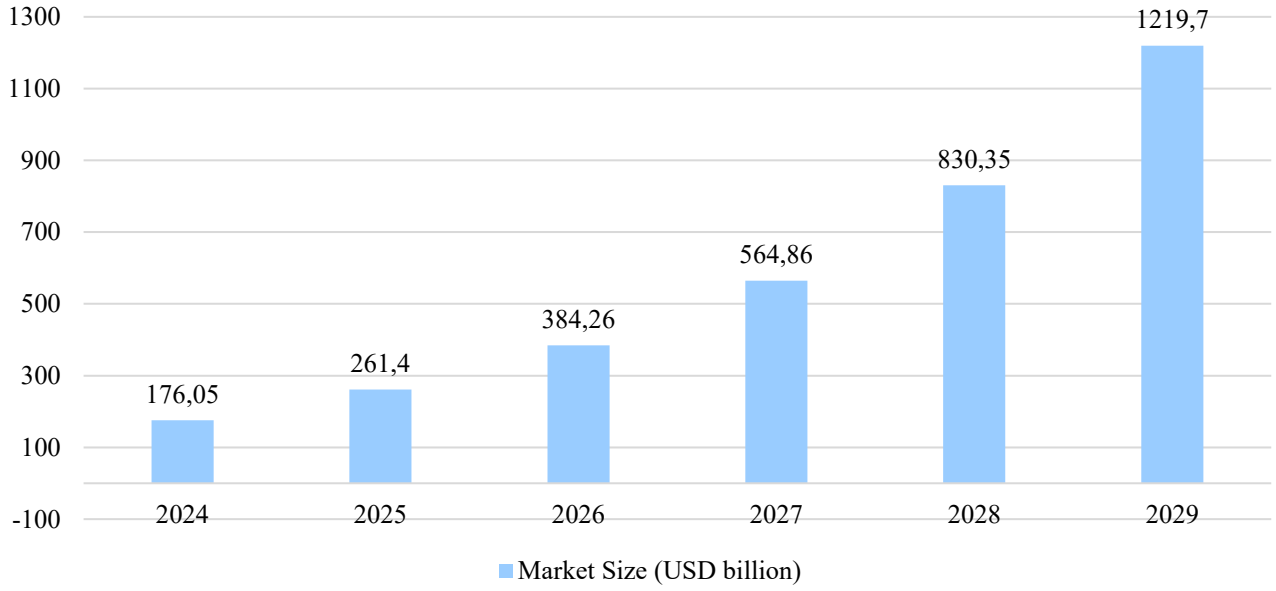

Figure 1 Neobanking Global Market Report 2025

A key determinant of the sector's rapid development is the accelerating digital transformation of traditional banking. The substitution of physical branch infrastructures with mobile interfaces, the adoption of cloud computing, and the automation of routine financial operations have reduced the cost base of financial service provision and reshaped customer expectations. Neobanks have capitalised on these conditions by building operational models entirely around digital architecture, enabling them to operate at significantly lower marginal costs compared to incumbent banks. This cost advantage allows neobanks to offer competitive pricing, including commission-free transactions, low-fee international transfers, and higher-yield digital savings accounts, thereby attracting young and globally mobile customers.

The structure of the neobanking market reflects a high degree of segmentation. Business accounts – used by sole proprietors, SMEs, freelancers, and multinational enterprises – represent a rapidly expanding category as firms seek real-time cash-flow management, automated invoicing, and seamless cross-border payments.

Personal accounts constitute another substantial segment, particularly for users who rely on mobile applications for day-to-day payments, budgeting, micro-investments, and consumer credit. Among the services driving growth, mobile banking interfaces, payments and money transfers, digital checking and savings accounts, and automated lending stand out as central components of neobanks' competitive offerings.

Technological innovation remains the principal engine of competitive differentiation. Artificial intelligence and machine learning are increasingly integrated into credit scoring, fraud detection, and personalised financial planning. AI-driven behavioural analytics enable neobanks to offer tailored recommendations, spending insights, automated savings tools, and dynamic risk adjustments. This technological personalisation significantly enhances user engagement and strengthens customer loyalty, particularly among younger demographics who prioritise transparency, immediacy, and user-centric design (The Business Research Company, 2025).

The global geographic distribution of neobanking development demonstrates significant regional asymmetries. Western Europe remains the largest market, supported by regulatory openness under PSD2, high digital payment adoption, and strong competition among digital-only financial institutions. In contrast, Asia-Pacific represents the fastest-growing region, fuelled by rapid smartphone penetration, large underbanked populations, and the expansion of low-cost digital financial ecosystems in India, Indonesia, Vietnam, and the Philippines. Latin America has also emerged as a dynamic centre of neobanking activity, illustrated by the rapid scale of Nubank, which has redefined the regional retail banking model through fee-free accounts and fully mobile credit services (The Business Research Company, 2025).

Market growth is further reinforced by technological advancements that enable neobanks to scale efficiently while expanding their product portfolios. Open banking frameworks facilitate secure data exchange across institutions, allowing neobanks to integrate diverse financial services – payments, lending, investments, insurance – into unified digital ecosystems. Embedded finance likewise strengthens neobanks'

competitive position by enabling financial products to be offered directly within non-financial platforms such as e-commerce, telecommunications, and gig-economy applications (Likarenko, 2025).

Despite these strengths, structural vulnerabilities persist. Neobanks continue to rely on partnering banks for deposit insurance, card issuing, and access to clearing systems, which places inherent limits on operational independence. Profitability also remains a challenge due to competitive pricing models, high customer acquisition costs, and the need for continuous investment in cybersecurity and regulatory compliance. These constraints have led many neobanks to adopt hybrid strategies that combine product diversification, premium subscription models, and regional expansion to stabilise revenue structures (Parakh, 2025).

Revolut represents one of the most advanced examples of neobanking evolution. Its cloud-native infrastructure, real-time processing architecture, and multi-currency capabilities have enabled rapid international expansion and a broad service offering that includes payments, international transfers, stock trading, cryptoasset operations, and automated budgeting tools. Revolut's emphasis on integrated financial services illustrates the transition from narrow digital banking to full-scale, platform-based financial ecosystems (Euromoney, 2025).

In Ukraine, the success of Monobank demonstrates the adaptability of digital-only models in emerging markets. Operating without physical branches and relying on advanced mobile interfaces, Monobank has built a highly engaged customer base by offering instant credit decisions, gamified financial tools, and effective in-app support. The acceleration of cashless payments in Ukraine since 2022 has further strengthened Monobank's position, highlighting the capacity of neobanks to enhance financial resilience and inclusion during periods of economic instability (Kostanic, 2025).

Taken together, the global expansion of neobanks, the technological integration shaping their service models, and the contrasting experiences of Revolut and Monobank reflect a structural transformation of the banking industry. Neobanks'

competitive advantages are reshaping market expectations and prompting traditional banks to accelerate digital transformation. The rapid expansion of neobanks reflects a profound transformation in the global financial ecosystem, driven by digitalisation, technological innovation, and changing consumer expectations. Digital-only banking models have demonstrated the capacity to reduce operational costs, enhance service speed, and deliver highly personalised financial experiences, fundamentally reshaping the competitive landscape. The acceleration of smartphone adoption, the rise of embedded finance, and the broad acceptance of cashless transactions further reinforce the structural momentum behind neobanking, positioning these institutions as central actors in the evolution of financial services (Al-Harbi, 2025).

Despite this momentum, the long-term configuration of the banking sector will depend on the dynamic interplay between neobanks and incumbent institutions. Traditional banks retain advantages rooted in regulatory experience, established trust, deep capital reserves, and a broad spectrum of financial products. These strengths are complemented by ongoing digital transformation efforts, including the adoption of cloud infrastructure, artificial intelligence, open banking APIs, and customer-centric design principles inspired by neobanking practices. As technological and regulatory convergence accelerates, the distinctions between digital-only banks and incumbents continue to blur, fostering an increasingly hybrid financial ecosystem (Shankar, 2025).

The future trajectory of banking is therefore likely to be characterised not by displacement, but by coexistence and mutual adaptation. Neobanks are expected to expand their influence through product diversification, entry into high-margin financial services, and international scaling supported by technological agility. At the same time, incumbent banks are poised to retain their systemic role by integrating fintech-driven innovations, forging strategic partnerships, and modernising operational infrastructures. The emergence of platform-based financial ecosystems – where traditional banks, neobanks, and technology firms interact within

interconnected digital environments – will further shape competitive dynamics (Iorgachova and Kovalova, 2025).

As digital finance becomes deeply embedded in everyday economic life, the institutions best positioned for long-term success will be those capable of balancing technological advancement with the stability, trust, and regulatory resilience expected from the banking sector. The rise of neobanks signals a permanent shift toward faster, more accessible, and customer-oriented financial services, while the adaptive responses of traditional banks indicate that the future of banking will unfold within a blended, collaborative model. This evolving landscape suggests a future in which innovation and institutional continuity coexist, creating a more flexible, inclusive, and technologically sophisticated global financial system.

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Perepadia D. Yu.

THE ROLE OF FINANCIAL MANAGEMENT IN SUSTAINABLE ENTERPRISE DEVELOPMENT

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The current operating environment for enterprises is characterised by growing economic uncertainty, intensifying global competition, transforming capital markets, and increasing demands from investors and society for business transparency. In such conditions, financial management takes on strategic importance, as it ensures that financial decisions are aligned with the long-term development goals of the enterprise and form the basis of its sustainability and competitiveness.

The essence of financial management lies in the comprehensive use of methods and tools for managing financial flows in order to maximise the value of the business and ensure stable economic growth. As I. Blank notes, financial management is the basis for the formation of an enterprise's financial policy and determines its capabilities for long-term development, investment activity and maintaining solvency (Blank, 2020).

The effectiveness of enterprise management largely depends on the ability of financial management to manage the company's liquidity, profitability and investment attractiveness. Western researchers, including R. Brealey, S. Myers and F. Allen, emphasise that financial management is not limited to cost control and cash flow optimisation, but plays a key role in strategic planning focused on creating added value for business owners (Brealey, Myers, & Allen, 2020). Thus, financial management integrates the system of enterprise activity into a broader economic and institutional context, ensuring a link between the internal resources of the enterprise and the external environment.

In the Ukrainian context, characterised by high macroeconomic instability, structural transformations and military challenges, the function of financial management related to risk management is of particular importance. According to S. Mochernyi and V. Kovalenko, financial management is a tool for stabilising

enterprise activity, as it allows for the timely identification of external threats, minimises their impact and preserves the competitive position of the enterprise (Mochernyi & Kovalenko, 2019). In this context, financial management should be seen as a basic element of the system of business organisation, combining financial stability, investment attractiveness and social responsibility.

In the context of global transformations, the integration of sustainable development principles into the financial management system of an enterprise is becoming particularly relevant. Over the past decades, the concept of sustainable development has evolved from a theoretical idea to a strategic imperative for business and the state. While initially perceived as a response to acute environmental problems, it has now become an important factor in shaping the long-term competitiveness of enterprises. According to the classic definition of the World Commission on Environment and Development, sustainable development means meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Contemporary research confirms that neglecting the environmental and social aspects of business leads to increased financial and reputational risks.

Financial management plays a key role in ensuring sustainable development, as it is through financial decisions that an enterprise's strategy is implemented, investment policy is formed, and resource allocation priorities are determined. A strategic approach to financial management involves taking into account the interaction of internal and external development factors, which allows the enterprise to achieve long-term goals and maintain stability in a changing environment. The importance of financial management goes beyond the simple allocation of financial resources, as it shapes the competencies that enable a company to adapt, innovate and strategically renew itself.

The practical dimension of sustainable development manifests itself in the ability of enterprises to adapt their business processes to the requirements of energy efficiency, emission reduction, rational use of resources, and the development of a

corporate culture of responsibility. Global practice shows that ignoring environmental and social standards is accompanied by an increase in financial losses, penalties, and loss of market position. In this context, the ESG concept, which covers environmental, social and governance criteria for evaluating the activities of enterprises, has become an important tool for integrating sustainable development principles into financial management.

Since the introduction of the Principles for Responsible Investment under the auspices of the United Nations, international investors have been increasingly taking ESG indicators into account alongside traditional financial indicators. For financial managers, this means the need to develop systems for collecting and analysing non-financial data, assessing the effectiveness of investments in sustainable development, and integrating relevant indicators into the financial control system. In Ukraine, the process of implementing ESG approaches is gradually gaining momentum, driven by the adaptation of national legislation to European standards and the growing role of international financial institutions.

An analysis of the financial dynamics of large Ukrainian agricultural holdings shows that companies that invest in production modernisation, logistics infrastructure development and ESG projects demonstrate higher financial stability even in times of crisis. Revenue growth and profitability are ensured through diversification of activities, cost optimisation, and the implementation of strategic financial decisions. Similar trends can be observed in Ukraine's IT sector, where financial management plays a key role in ensuring the adaptability of business models to changes in global demand and the growth of operational risks.

Summarising the results of the analysis allows us to identify strategic directions in financial management that drive sustainable development of enterprises: implementation of long-term investment strategies, ensuring crisis resilience, and increasing the transparency of financial and non-financial reporting. The integration of ESG criteria into financial strategies creates a synergistic effect, combining economic, social and environmental development goals.

Thus, financial management in modern conditions is transforming from an operational management tool into a strategic mechanism for ensuring the sustainable development of enterprise activities. Its role is to build financial stability, increase investment attractiveness and strengthen stakeholder confidence. Further scientific research should be focused on developing practical methods for integrating ESG criteria into various segments of financial management and assessing their impact on the long-term performance of enterprises in a transitional economy.

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FINANCIAL LITERACY AMONG STUDENTS: DOES KNOWLEDGE TRULY INFLUENCE FINANCIAL BEHAVIOR?

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In the era of digital technology and the rapid financialization of society, where financial services have become complex, accessible, and sometimes perilous, the

issue of financial literacy is of critical importance. Student youth, standing at the threshold of transition from dependence to full financial independence, represent one of the most vulnerable and yet most promising demographic groups. The financial habits and attitudes formed during this period will significantly determine their future economic well-being, resilience to crises, and ability to achieve long-term goals.

The relevance of this topic is intensified against the backdrop of global trends: rising debt burdens among the young (student loans, consumer credit), the aggressive promotion of fintech products that encourage instant transactions, and the growing realization that state pension systems may be insufficient to maintain quality of life in the future. While considerable global evidence suggests a positive correlation between the level of financial knowledge and successful financial behaviors, reality demonstrates that this connection is far from straightforward and unambiguous.

We often observe a rift between theory and practice, a paradox that can be summarized as "I know, but I don't do". A student may excel in understanding compound interest and diversification, yet consistently overspend, take out high-interest loans for entertainment, or ignore saving opportunities. This indicates that financial literacy is a phenomenon far more complex than a simple sum of knowledge. It is a nexus of psychological, social, and economic factors that collectively shape an individual's ultimate financial behavior.

The purpose of this article is to conduct a deep analysis of the intricate relationship between the financial knowledge of students and their actual financial behavior. We will explore not only what students know but, primarily, why they act in certain ways despite their knowledge. The article will examine the structure of financial literacy, identify key barriers on the path from knowledge to action – including psychological biases, socio-economic context, and family influence – and propose practical ways to enhance the effectiveness of financial education to overcome these barriers.

The Essence and Structure of Financial Literacy

Financial literacy should not be viewed as one-dimensional knowledge but as a multi-layered competence. Experts from the OECD and leading researchers distinguish three fundamental, interconnected components that reinforce one another:

1. *The Cognitive Component (Knowledge):* This is the foundational layer, comprising an understanding of key financial concepts. These include:

- *Interest (Simple and Compound):* Understanding the mechanism of "interest on interest" is fundamental to assessing the benefits of long-term savings and the risks of loans.
- *Inflation:* The awareness that money loses value over time, which necessitates seeking ways to preserve and grow capital.
- *Return, Risk, and Diversification:* The ability to assess the relationship between higher returns and higher risks, and the understanding of the need to spread investments.
- *Time Value of Money:* The concept that money available today is worth more than the identical sum in the future due to its potential earning capacity.
- *Taxation and Financial Obligations:* Familiarity with the basics of the tax system and the legal aspects of financial agreements.

2. *The Behavioral Component (Skills):* This refers to the ability to apply knowledge in real-life situations. It includes:

- *Budgeting and Expense Tracking:* The capacity to plan income and expenditures and analyze cash flows.
- *Setting Financial Goals:* Defining short-term (e.g., buying a laptop) and long-term (e.g., graduate studies, a down payment on a home) objectives.
- *Comparative Analysis Skills:* The ability to choose between different financial products (bank accounts, credit cards, deposits) by analyzing their terms, fees, and interest rates.
- *Building a Financial "Safety Net":* Understanding the necessity of creating a reserve for unforeseen expenses.

3. *The Affective Component (Attitudes/Beliefs):* This is the most profound and enduring component, determining motivation. It is shaped by family, experience, and personal traits:

- *Financial Discipline:* Self-control and the ability to forgo immediate desires for future benefits.
- *Financial Self-Efficacy:* Confidence in one's ability to manage personal finances.
- *Long-Term Orientation:* A focus on the future and the capacity for delayed gratification.
- *Responsible Attitude Towards Debt:* Understanding debt as a tool, not a source of additional funds.

The lack of a developed affective component is most often the "weak link" that causes the "knowledge -> skill -> action" chain to break.

The "I Know, But I Don't Do" Paradox: Why Knowledge Is Not Enough

Empirical research, such as the meta-analysis by Fernandes, Lynch, and Netemeyer (2014), shows that formal financial education has a rather modest impact on real financial behavior in the long term. This is explained by the powerful barriers that stand between knowledge and action.

Thus, the link between financial literacy and the financial behavior of students is complex, non-linear, and multi-faceted. Financial knowledge is a necessary but entirely insufficient condition for forming healthy financial behavior. It serves as a map of the terrain but not the driving force that determines the direction of travel.

The true determinant of behavior is the interaction of knowledge with the powerful forces of psychology (biases), society (family, friends, culture), and economic constraints. Effective financial education must be designed with these limitations in mind. It should be not a lecture, but a training aimed at forming not only knowledge and skills but, most importantly, the right financial habits and attitudes. The future of financial education lies in integrated programs that combine economic theory, psychological practices, and real-world tools to help students not

just *know*, but *know how to*, and, crucially, *want to* build their own financially stable future.

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SUPPLY CHAIN MANAGEMENT IN TIMES OF CRISIS AND INSTABILITY

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Modern conditions for business operations are characterised by a high level of dynamism, uncertainty and crisis instability, caused by global economic transformations, geopolitical risks, military actions, disruption of traditional logistics routes, resource shortages and rapid development of digital technologies. In such conditions, the problem of forming effective and adaptive supply chain management systems capable of ensuring continuity of goods turnover, reducing costs and maintaining the competitiveness of enterprises becomes particularly relevant. Supply chains are turning into complex multi-level systems in which material, information, financial and service flows interact, and any failure in a particular area can cause significant losses for all participants.

The functioning of supply chains in conditions of crisis instability requires a rethinking of traditional approaches to logistics management. Whereas previously the priority was to optimise costs and minimise inventories, in today's environment, flexibility, adaptability, resilience, and the ability to respond quickly to changes in the external environment are coming to the fore. Supply chain management is increasingly based on a functional approach that involves the integration of classic management functions – planning, organising, motivating, controlling and regulating – within a single logistics system. Regulation as a management function is particularly important, as it ensures that management decisions are adjusted in line with changes in market conditions, demand, supply and resource constraints.

Supply chains in the modern economy cover the entire value creation cycle – from the supply of raw materials and supplies to the delivery of finished products to the end consumer. They include the processes of procurement, transportation, storage, customs clearance, distribution, accounting and after-sales service. In crisis conditions, these processes are complicated by disruptions to the logistics

infrastructure, changes in transport routes, restrictions on the use of vehicles, staff shortages and increased logistics risks. Accordingly, the effective management of supply chains is becoming one of the key factors in ensuring the stability of enterprises' production and economic activities.

An important characteristic of modern supply chains is their information saturation. Information becomes a strategic resource that determines the quality of management decisions and the level of adaptability of logistics systems. The use of integrated information systems ensures transparency of flows, synchronisation of the actions of supply chain participants, and rapid response to changes in supply and demand. In conditions of instability, the ability to replace physical stocks with information about them becomes particularly important, reducing storage costs and minimising the risks of excess or shortage of stocks.

The digitisation of logistics management contributes to the formation of new supply chain management models focused on the use of modern information technologies. These technologies include supply chain management systems that provide integrated planning, coordination and control of material and information flows in real time. The implementation of such systems makes it possible to improve service levels, shorten production and logistics cycles, optimise resource use and increase the resilience of supply chains to external shocks. In crisis conditions, digital tools become the basis for the formation of adaptive logistics models capable of maintaining the continuity of goods turnover even under significant restrictions.

Adaptive logistics models for supply chain management involve a flexible combination of strategic and operational management. At the strategic level, they focus on diversifying suppliers, developing alternative logistics routes, creating reserve capacity, and forming partnerships between chain participants. At the operational level, adaptability manifests itself in the ability to quickly change delivery schedules, order volumes, transportation routes, and warehousing solutions depending on the current situation. This approach reduces the vulnerability of supply chains to risks and ensures the stability of production processes.

In times of crisis and instability, risk management in supply chains requires special attention. Risks can be both internal and external in nature and manifest themselves in the form of supply disruptions, price fluctuations, loss of product quality, reduced reliability of partners, or information failures. Effective risk management involves identifying and assessing risks, developing preventive measures, and implementing rapid response mechanisms. In this context, information systems play an important role in monitoring key indicators and supporting informed management decisions.

A functional approach to supply chain management allows for the systematisation of management processes and ensures the coordination of actions among all participants. Planning defines the goals and parameters of the supply chain's functioning, organisation ensures the formation of an appropriate structure and distribution of resources, motivation is aimed at stimulating effective interaction between staff and partners, control allows for the evaluation of results and identification of deviations, and regulation ensures the adjustment of management decisions in accordance with changes in the external environment. Such integration of management functions is the basis for the formation of sustainable and adaptive logistics systems.

Modern supply chains are becoming increasingly networked, which necessitates coordination between a large number of participants. In these conditions, the role of partnership, information exchange and joint planning is growing. A customer-oriented approach is becoming a defining principle of management, since meeting consumer needs in terms of quantity, quality, place, and time is the ultimate goal of the supply chain. Accordingly, the effectiveness of logistics management directly affects the competitive position of a company in the market.

In conclusion, it should be noted that in conditions of crisis and instability, adaptive supply chain management is a necessary condition for ensuring the continuity of trade and sustainable development of enterprises. The formation of such systems requires a combination of a functional approach, modern information

technologies and effective risk management. Supply chains should be viewed as complex systems capable of self-regulation and rapid adaptation to changes in the external environment. Further research in this area should focus on developing practical tools for assessing the adaptability of logistics systems and substantiating models for their digital transformation.

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REMOTE AND HYBRID MODELS OF PERSONNEL MANAGEMENT IN THE CONTEXT OF CONTEMPORARY SOCIO-ECONOMIC CHALLENGES

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The current stage of global economic development is characterised by a high level of instability caused by a combination of global socio-economic, technological and security challenges. The COVID-19 pandemic, military conflicts, the digitalisation of business processes, the growth of labour mobility and the

transformation of labour values have significantly influenced approaches to work organisation and human resource management. Under these conditions, traditional management models focused on the physical presence of employees in the office are increasingly proving to be insufficiently effective. In response to these challenges, organisations are actively implementing remote and hybrid personnel management models, which are seen as an important tool for increasing adaptability and resilience.

The remote personnel management model involves performing work duties outside the office using digital means of communication, task management, and performance monitoring. Its spread has been made possible by the development of information and communication technologies, cloud services, corporate platforms, and electronic document management systems. This model provides organisations with access to a wider labour market, allows them to attract specialists regardless of their place of residence, and reduces the costs of maintaining office infrastructure. For employees, remote work creates conditions for flexible schedules, a better work-life balance, and greater autonomy in performing tasks.

At the same time, the remote personnel management model is accompanied by a number of problems that require a systematic solution. Among them, issues of effective communication, support for team interaction, and preservation of corporate culture occupy a special place. The lack of direct contact between employees and management can lead to reduced engagement, complications in informal knowledge sharing, and a weakening of organisational identity. In addition, the remote format increases information security risks, requiring organisations to implement additional data protection measures and foster responsible digital behaviour among staff.

The hybrid model of personnel management is a combination of remote and office forms of work organisation. It involves the partial presence of employees in the workplace, combined with remote work on other days or for certain types of tasks. This approach combines the flexibility of remote work with the opportunities for personal interaction that remain important for team coordination, mentoring, and

corporate culture development. The hybrid model helps maintain social ties within the team and increases the level of trust between employees and management.

At the same time, the introduction of a hybrid model requires a more complex management system, as it is necessary to coordinate different working modes, ensure equal opportunities for employees regardless of their employment format, and avoid discrimination between office and remote employees. Considerable attention should be paid to clearly defining the criteria for evaluating work performance, organising communication processes, and establishing uniform standards for corporate interaction.

In the context of modern socio-economic challenges, the transformation of the role of a manager in the personnel management system is becoming particularly relevant. The transition to remote and hybrid models requires managers to develop new competencies, including the ability to work with distributed teams, maintain employee motivation without constant personal supervision, effectively use digital management tools, and build trust based on results rather than processes. Leadership focused on support, communication, and staff development, rather than just formal administration, is becoming increasingly important.

An important factor in the successful functioning of remote and hybrid models is a corporate culture adapted to the conditions of the digital environment. Organisations must develop shared values, norms and rules of interaction that remain understandable and acceptable to all employees, regardless of their work format. Regular online meetings, transparent communication channels, new employee adaptation programmes, and measures aimed at supporting the psychological well-being of staff play a significant role in this.

Thus, remote and hybrid HR management models are a natural response by organisations to current socio-economic challenges. They open up new opportunities for increasing flexibility, efficiency and competitiveness, but at the same time require a comprehensive approach to their implementation. The successful implementation of these models depends on the level of digital maturity of the organisation, the

readiness of staff for change, the effectiveness of management decisions and the ability to combine technological innovation with a focus on people as a key resource for development.

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DIGITALIZATION OF THE ECONOMY: CHALLENGES AND PROSPECTS

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In the modern world, digitalization has become a key factor in economic development, shaping its new structure, dynamics, and competitiveness. This process involves the deep integration of digital technologies into all spheres of economic activity – from production and finance to education, healthcare, and public administration. The digital economy is not merely a transition from paper documents to electronic ones, but a systemic transformation of business models, management

processes, and interactions among market participants. Its main drivers include the development of information and communication technologies, the spread of the Internet, the use of Big Data, artificial intelligence, blockchain, cloud services, and the Internet of Things.

Digitalization of the economy opens new opportunities for increasing productivity, creating innovative products and services, optimizing production processes, and reducing costs. According to the World Bank, the digital sector demonstrates growth rates that exceed the global economic average. In countries that actively implement digital solutions, there is an increase in employment in high-tech industries, the share of small and medium-sized enterprises, and the overall quality of life. At the same time, digitalization requires essential prerequisites – modern infrastructure, high digital literacy, a proper legal framework, and institutional capacity for change.

Despite numerous advantages, digital transformation is accompanied by a number of challenges. One of the main challenges is the digital divide – inequality in access to technologies, the Internet, and digital skills. In developed countries, Internet penetration exceeds 90%, while in many developing countries only about a quarter of citizens have stable online access. This creates risks of socio-economic marginalization of certain groups and regions.

Another challenge is infrastructural limitations. Developing the digital economy requires significant investments in modern telecommunications networks, data centers, software, and cybersecurity. In countries with limited financial resources or outdated technologies, this process is often slowed down. A related issue is the shortage of skilled personnel – the labor market requires experts in data analytics, artificial intelligence, cybersecurity, and software development, while the education system does not always keep pace with technological changes.

Insufficient legal regulation of digital activities also poses economic risks. Issues such as personal data protection, digital identification, cybersecurity, e-commerce, and taxation of digital platforms require clear legal frameworks.

Moreover, the development of central bank digital currencies and virtual assets increases the need for international coordination of financial oversight. Cybercrime is also a growing threat: as online transactions and cloud technologies expand, the number of cyberattacks increases, potentially leading to financial losses and undermining user trust.

Digitalization also transforms the labor market. Process automation, robotics, and artificial intelligence lead to a reduction in traditional jobs and the creation of new professions requiring entirely different skills. This generates social challenges – the need for workforce retraining, modernization of educational programs, and ensuring employment in the new economic conditions. Additionally, environmental issues arise although digital technologies help reduce resource consumption, equipment production and disposal, as well as energy consumption by data centers, generate ecological burdens.

A crucial component of successful digitalization is the formation of a new institutional ecosystem capable of supporting transformation processes and ensuring their sustainability. This includes not only government structures but also business associations, research and educational institutions, technology hubs, startup incubators, and other organizations fostering an innovation friendly environment.

Such institutional interaction enables knowledge exchange, partnership development, and the creation of cooperation mechanisms between the public and private sectors. Thanks to this, many countries have been able to implement large-scale digital reforms, attract investments, and accelerate the adoption of technological solutions.

Alongside institutional development, the growing role of data as a strategic resource is particularly important. In the digital economy, data become a key production factor, similar to capital or natural resources. Effective data management enables deep analytics, accurate forecasting, improved management decisions, and the creation of personalized products and services. This generates competitive

advantages for states and businesses that use data responsibly, transparently, and securely.

The development of digital ecosystems integrating various services, tools, and platforms into an interconnected space is also critical. Such ecosystems ensure the accessibility of digital services, simplify interaction between users, businesses, and government, and promote digital inclusion. At the governmental level, creating integrated e-service platforms enhances transparency, efficiency, and citizen trust. For businesses, digital ecosystems open opportunities for new models of customer interaction, process optimization, and innovation implementation.

Another key trend is the increasing influence of artificial intelligence across different spheres of social life – from industry and logistics to education and healthcare. AI systems can automate routine operations, improve diagnostic accuracy, optimize production processes, and enhance service quality. At the same time, there is a need for clear ethical standards for the use of algorithms, as they can affect management decisions, privacy levels, and personal data protection.

In summary, digitalization is forming a new model of global economic development in which technological innovations, data literacy, and the ability to effectively integrate digital solutions across all spheres of social life play a leading role.

The prospects of digitalization are enormous. Using digital technologies increases production efficiency, reduces costs, accelerates information exchange, and fosters innovation. At the national level, it contributes to economic competitiveness, transparent governance, and the creation of new revenue sources. At the business level, digitalization enables new business models – e-commerce, online services, and platform-based economies. The development of smart cities, e-governance, fintech, and digital healthcare demonstrates that digital technologies are becoming the foundation of economic progress.

To implement the digital economy effectively, comprehensive strategies must be adopted: developing digital infrastructure, improving digital literacy, modernizing

legislation, supporting innovative entrepreneurship and startups, and ensuring cybersecurity. It is also important to create conditions for digital inclusion, providing equal access to digital services regardless of region, age, or social status. Successful digitalization requires cooperation among the state, businesses, educational institutions, and civil society.

Thus, digitalization of the economy is not a temporary trend but a long-term global process that will determine the development of humanity in the 21st century. It creates vast opportunities for growth while presenting new challenges that require strategic management. The future economic success of countries depends on how effectively they can integrate digital technologies, develop human potential, and ensure sustainable innovative progress.

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GEO-ECONOMICS: HOW SANCTIONS AND TRADE WARS SHAPE THE GLOBAL ECONOMY

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Economic sanctions are a powerful geo-economic tool, but their effectiveness varies widely depending on the target and the political context. They tend to work best against smaller or economically dependent states that cannot easily replace lost

trade, technology, or financial access. Larger, resource-rich, or politically insulated countries often withstand sanctions for long periods, especially when they can shift the economic burden onto their populations or find alternative partners.

Sanctions can still serve symbolic purposes, signaling international unity, isolating a regime, or deterring others, even when they fail to change behavior. Targeted sanctions aimed at elites or specific industries are generally more effective than broad embargoes, which can harm civilians and strengthen authoritarian control. At the same time, sanctions often produce unintended consequences, such as encouraging countries to build alternative financial systems or deepening alliances among sanctioned states. Overall, sanctions can achieve political or strategic goals, but only when they are well-coordinated, realistic, and applied to economically vulnerable targets (Drezner, 2011).

Trade wars often create economic damage on both sides that goes far beyond the original political goals. When tariffs are imposed, the cost of imported goods rises, and companies usually pass those higher costs on to consumers, reducing purchasing power. Businesses that rely on global supply chains also face higher production costs when key inputs become more expensive, which can make domestic industries less competitive rather than protecting them. Retaliation from trading partners adds further strain, hurting exporters who suddenly face new barriers or shrinking markets. The uncertainty created by trade conflicts disrupts investment plans, slows economic growth, and forces companies to rethink or relocate supply chains. Over time, trade wars can trigger long-term strategic shifts, pushing countries to diversify away from each other and weakening economic interdependence that once acted as a stabilizing force (Bown & Kolb, 2021).

Sanctions can also push targeted countries toward greater technological self-sufficiency, but the process is uneven and often comes with significant costs. When sanctions cut off access to foreign technology, components, or investment, governments and firms have strong incentives to develop domestic alternatives. This

can lead to rapid growth in protected industries, heavy state investment, and the emergence of new national champions.

Sanctions also encourage countries to deepen partnerships with non-aligned states, creating alternative supply chains and technological blocs. However, the transition is rarely efficient: domestic substitutes often lag behind global standards, and the cost of building entire industries from scratch can be enormous. Innovation may slow in the short term as firms lose access to cutting-edge tools, global talent, and international markets. Over time, sustained pressure can reshape a country's industrial strategy, pushing it toward long-term resilience and reduced dependence on foreign technology.

Trade restrictions tend to push inflation and commodity prices upward because they disrupt the smooth flow of goods, raise production costs, and inject uncertainty into global markets. When tariffs or export controls are introduced, imported goods become more expensive, and companies often pass those higher costs on to consumers. This feeds directly into inflation, especially in sectors that rely heavily on foreign inputs such as electronics, machinery, and food. Producers also face higher costs for raw materials and components, which can reduce supply and push prices up even further. Commodity markets are particularly sensitive: restrictions on energy, metals, or agricultural products can trigger sharp price spikes as countries scramble to secure alternative suppliers. These shocks ripple across global supply chains, raising transportation costs, slowing production, and amplifying inflationary pressures. In the long run, persistent trade barriers can lead to more fragmented global markets, less efficiency, and structurally higher prices (Fajgelbaum, 2020).

Alliances and regional trade blocs play a central role in geo-economic conflicts because they shape who has leverage, who has protection, and how economic pressure is applied or resisted. They act as both shields and weapons in an increasingly fragmented global economy. Alliances amplify the power of sanctions, export controls, and trade restrictions by coordinating actions among multiple

countries. When measures are multilateral rather than unilateral, they become far harder for the targeted state to evade.

Regional blocs such as the EU, USMCA, or ASEAN also create large internal markets that cushion member states from external shocks, reducing their vulnerability to economic coercion. At the same time, these blocs can become platforms for collective retaliation, allowing smaller states to exert influence by acting together. Trade blocs also shape supply-chain geography, as companies relocate production inside allied regions to avoid tariffs, reduce political risk, or comply with shared standards. This deepens economic integration within blocs while widening the divide between rival geopolitical camps. In some cases, alliances evolve into "economic security communities," coordinating investment screening, technology controls, and industrial policy (Farrell & Newman, 2019; Kim & Milner, 2020).

Overall, future geopolitical tensions are likely to produce a world where trade is shaped less by pure economics and more by strategic alignment, risk management, and the desire for autonomy. The result is a more divided global economy with multiple competing centers of production and influence. Geo-economics explains how countries use economic tools, sanctions, tariffs, export controls, and trade restrictions, to pursue political and strategic goals. These tools can pressure rivals, reshape alliances, and influence global power balances without resorting to military force.

Sanctions can isolate states or weaken key industries, but their effectiveness depends on coordination among major powers and the vulnerability of the targeted country. Trade wars disrupt supply chains, raise costs, and often produce unintended consequences like inflation, retaliation, and long-term shifts in production. As geopolitical tensions rise, nations increasingly prioritize economic security over efficiency, leading to regionalized supply chains, "friend-shoring," and competing technological spheres. Geo-economics thus shows how economic interdependence

becomes both a source of leverage and a battlefield in modern international relations (Blackwill & Harris, 2016).

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ENGINEERING

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EVALUATION OF TRANSMISSION PERFORMANCE IN ELECTRIC VEHICLES

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An electric vehicle is a means of transportation that uses one or more electric motors powered by autonomous energy sources such as battery packs, fuel cells, or capacitors. Unlike conventional automobiles, an electric vehicle does not have an internal combustion engine. Interestingly, the first electric vehicle appeared earlier than cars equipped with internal combustion engines. As early as 1841, a prototype in the form of a cart with an electric motor was created. However, the main issue with early electric vehicles was the difficulty of charging due to the lack of technologies capable of converting alternating current to direct current (Cameralabs).

The renewed interest in electric vehicles was driven by increased environmental awareness and rising fuel prices, particularly during the energy crises of the 1960s. The active era of private transport electrification began in 2010. The popularity of hybrid vehicles facilitated a gradual transition to new forms of mobility and marked the beginning of a technological breakthrough. Fifteen years ago, forecasts predicted that by 2020 the global electric vehicle fleet would reach 20–24 million units (SHRAM).

Since their inception, electric vehicles have undergone remarkable development – from a simple cart to an advanced means of transportation. The first mass-produced model to enter large-scale production was the Tesla Model S. However, Ukraine currently does not have its own electric vehicle manufacturing sector.

Compared to traditional automobiles, electric vehicles offer significant advantages. Their efficiency is considerably higher, the absence of exhaust gases

makes them environmentally friendly, and their design eliminates the need for substances such as antifreeze or engine oil. Their construction is simpler, and they can be charged both from a standard electrical outlet and at specialized charging stations. Additionally, regenerative braking partially replaces the functions of conventional braking systems.

Beyond technical aspects, the development of electric vehicles has a substantial positive impact on the economy and social sphere. Like any major innovation, they have become a catalyst for significant societal change.

The evaluation of transmission performance in electric vehicles is based on an in-depth analysis of the key components of the electric drive system.

The power system of an electric vehicle that supplies the transmission typically consists of traction batteries or fuel cells. When fuel cells are used, electric current is generated as a result of the reaction between hydrogen and oxygen – known as cold combustion. The current characteristics vary depending on the parameters of the energy source and the applied load. System voltage is also a critical factor, as it influences the overall performance of the vehicle as well as its dynamic properties (Pischinger end Seiffert, 2016).

Modern power electronics enable the conversion of direct voltage into alternating voltage with adjustable amplitude and frequency, ensuring efficient control of induction-type motors. These systems are engineered to optimize operating voltage across various transmission modes, contributing to maximum efficiency. Most electric drives are equipped with single-speed gearboxes that effectively match motor speed to wheel rotational speed (Kampker et al., 2018; Zaidan et al., 2024).

One of the common design approaches is the use of an axle drive with a centrally positioned electric motor that converts electrical energy into mechanical power. This technology has been implemented in models such as the Tesla Model S, which demonstrates power output exceeding 300 kW and torque reaching 6000 N·m (Fig. 1).

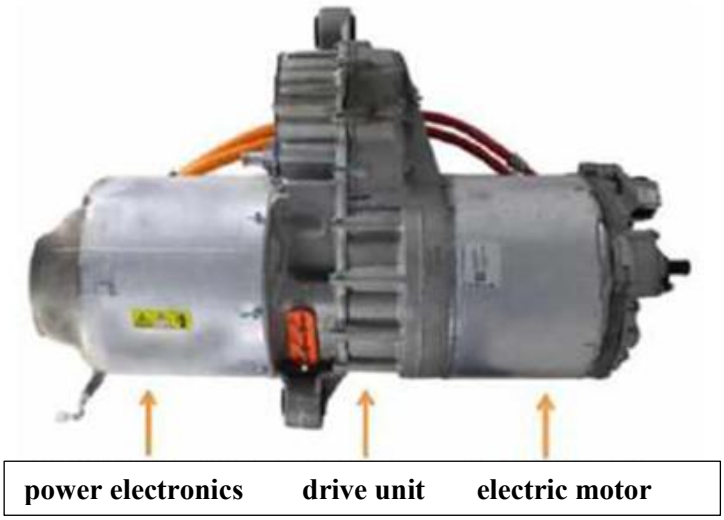

Fig. 1. Electric transmission of the Tesla Model S as a central drive with a mechanical differential

Two-speed systems with independent gear reducers for optimal torque distribution are also used, a design typical of axle configurations such as that implemented in the Mercedes SLS. Figure 2 shows one such electric axle used in the Mercedes SLS electric drive.

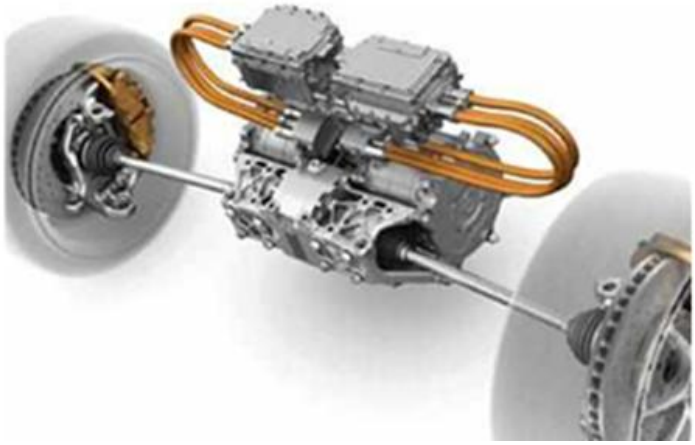

Figure 2. Electric axle of the SLS electric drive with two electric motors without a differential

An innovative solution is the use of drives integrated directly into the wheel hubs. This approach increases interior space due to the absence of a central transmission, which is particularly relevant for large vehicles such as buses. An example of such a drive is shown in Figure 3.

Figure 3. Wheel-hub drive by Protean

However, the widespread adoption of this configuration is limited by the complexity of integrating the system into wheel assemblies and the need to generate high torque.

The main trend in the development of transmission systems is the creation of integrated central drives with motor rotational speeds exceeding 20,000 rpm. Such technologies open up opportunities for improving energy efficiency and expanding the practical applications of electric drive systems.

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INTERNAL COMBUSTION ENGINES AND ELECTRIC POWERTRAINS IN MODERN VEHICLES: A COMPARATIVE ANALYSIS

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Introduction

Transportation is undergoing one of the most significant technological shifts in its history. Electrification is accelerating rapidly as battery costs fall, charging networks grow, and governments introduce strong policy incentives to reduce emissions. At the same time, internal combustion engine (ICE) technology is far from stagnant: engineers continue to push efficiency and performance through advanced combustion strategies, turbocharging, hybridization, and cleaner after-treatment systems. As a result, the modern transport landscape is shaped by two parallel developments – fast-rising electric vehicle (EV) adoption and ongoing innovation in ICE powertrains – both of which influence how consumers, manufacturers, and policymakers evaluate future mobility options.

Operating principles

Internal combustion engines convert chemical energy in fuels (gasoline, diesel, biofuels, or hydrogen in special cases) into mechanical work via in-cylinder combustion, involving pistons, crankshafts, valvetrains and complex after-treatment systems. Electric powertrains convert electrical energy stored in batteries into mechanical torque through electric motors and power electronics, with far fewer moving parts and different maintenance needs. Technical differences have implications for efficiency, complexity, and lifecycle emissions.

Environmental impact and life-cycle assessment (LCA)

Direct tailpipe emissions distinguish ICEs from battery electric vehicles (BEVs): ICEs emit CO_2, NO_x, and particulates during operation; BEVs have zero tailpipe emissions. However, LCA studies show the full picture – BEVs generally produce lower greenhouse gas emissions over their lifecycle (manufacture, operation, end-of-life) in most markets, especially where electricity mixes are relatively low-carbon. Multiple recent LCAs and reviews conclude that BEVs outperform ICE vehicles on lifetime GHG emissions in most realistic scenarios, though the magnitude depends on electricity generation mix and battery production impacts.

Market context and battery costs

Rapid electrification is supported by a sharp decline in lithium-ion battery costs: Bloomberg NEF reported record lows near $139 per kWh in 2023, with further declines reported into 2024–2025 – a key driver making EVs more price-competitive on a total-cost-of-ownership basis. Concurrently, EV global sales rose strongly (nearly 14 million electric cars in 2023, and industry reports note continued growth into 2024), increasing market availability of models and economies of scale. These trends are central to the economic comparison between ICE and electric powertrains.

Economics and total cost of ownership (TCO)

- *Manufacturing costs*: ICE vehicles currently benefit from mature supply chains and lower initial unit cost for comparable models, while EVs have higher upfront costs mainly due to batteries.

- *Operating costs:* EVs typically have lower energy (per km) and maintenance costs because of higher drivetrain efficiency and fewer moving parts. Declining battery prices and supportive policies accelerate parity or superiority of EVs in TCO analyses for many segments and regions. The balance varies with local electricity prices, fuel taxes, and incentives.

Performance, range, and charging

ICE vehicles continue to lead in fuel energy density and rapid refueling: filling up an ICE car takes only a few minutes and provides long driving ranges, which

remains a key advantage for long-distance travel and heavy-duty applications. BEVs, by contrast, offer high instant torque and smooth power delivery, often outperforming ICE vehicles in urban acceleration and overall drivability. Charging technology is advancing quickly: ultra-rapid DC chargers (up to ~350 kW) can recharge many modern EVs from a low state of charge to about 80% in roughly 20–30 minutes, depending on the vehicle and battery chemistry. This is gradually narrowing the usability gap for longer trips as charging infrastructure continues to expand. Home and workplace Level-2 charging also remain essential for everyday convenience.

ICE improvements and alternative fuels

ICE technology has continued to mprove: downsizing combined with turbocharging, direct injection, variable valve timing, optimized combustion strategies, and advanced after-treatment systems has significantly improved thermal efficiency and reduced emissions. Hybridization – both mild and full hybrids – integrates ICEs with electric assistance to further lower fuel consumption and emissions under real-world driving conditions. In addition, sustainable fuels, such as biofuels and synthetic e-fuels, as well as hydrogen combustion engines, are being explored as transitional or niche solutions, particularly for heavy-duty transport. These advancements indicate that ICEs are likely to remain relevant in specific sectors for the foreseeable future.

When comparing ICEs and electric powertrains, context is crucial. In passenger urban transport and light-duty fleets, BEVs are already highly competitive and are rapidly becoming the dominant choice for new vehicle sales in many markets. In contrast, for long-haul freight, aviation, and certain heavy-duty applications, ICEs – potentially using low-carbon fuels – or fuel-cell/hydrogen solutions are likely to remain in use longer due to energy-density limitations and infrastructure constraints. A plausible near-to-mid-term scenario envisions a heterogeneous fleet: increasing BEV adoption in light vehicles, advanced ICEs and hybrid powertrains in mid-range segments, and targeted use of low-carbon fuels or hydrogen in heavy transport.

Conclusion

The transition toward electrified transport is accelerating, driven by supportive policies, declining battery costs, and technological advancements. Lifecycle analyses generally indicate that BEVs produce lower greenhouse gas emissions, particularly in regions where electricity generation is low-carbon. Nevertheless, improvements in ICE efficiency, hybridization, and alternative fuels suggest that internal combustion technology will continue to play a role in certain niches for the foreseeable future. Accordingly, policymakers and industry stakeholders should adopt multi-faceted strategies: expand clean electricity generation and charging infrastructure, continue enhancing ICE efficiency and investing in sustainable fuel research and development, and plan for a diverse set of solutions across different transport sectors.

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Kuleshov I. O.

A STUDY OF DYNAMIC CHARACTERISTICS AND OPTIMIZATION OF VEHICLE SUSPENSION FOR RIDE SMOOTHNESS

Language Advisor – Senior Lecturer Vorobyova S. V.

The accurate and efficient design of vehicle suspension systems is paramount for ensuring optimal ride comfort, handling, and safety. The kinematic analysis-the study of motion without considering forces-is a critical, yet often cumbersome, step in this process. This study examines current methodological and software-based approaches to *automating the determination of kinematic parameters* in suspension design. It identifies three main approaches: dedicated mechanical design software, custom scripting/modeling environments, and emerging AI-driven optimization techniques. The advantages and disadvantages of each method are discussed to guide engineers in selecting the most suitable tool for their specific development needs.

The performance of any vehicle is inherently linked to its *suspension system,* which manages the interaction between the wheels and the chassis. Critical design parameters, such as *camber angle* (γ), *toe angle* (δ), and *roll center height* (h_{RC}), dynamically change throughout the wheel's travel (jounce and rebound). Determining these changes involves complex geometric analysis, which traditionally required tedious manual drafting or calculation.

The sequence of kinematic design in modern engineering is regulated by the need for quick iteration and high precision. To generate a robust suspension design, the following steps must be taken:

1. Definition of hard points (pivot locations) in 3D space.
2. Determination of instantaneous centers of rotation for key components.
3. Calculation of kinematic parameters across the full range of wheel travel.
4. Visualization of parameter changes (e.g., bump steer curve).
5. Optimization of hard points to achieve desired performance targets.

The process of calculating these parameters is complex, as it relies on large numbers of existing geometric constraints and often involves solving systems of non-

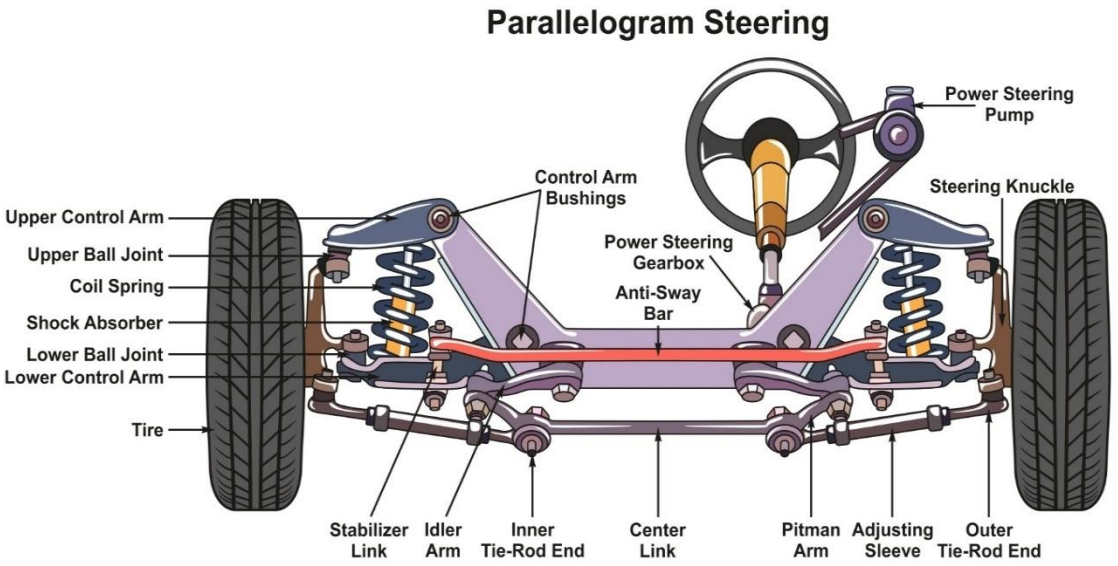
linear equations. Moreover, desired characteristics (e.g., maintaining minimal camber change during roll) are constantly being adjusted in accordance with driver feedback and simulation results. Thus, the process of suspension kinematic analysis is not only responsible but also rather cumbersome, dynamic, and labor-intensive. As a result, existing approaches to automation are increasingly used to determine and optimize these parameters, significantly saving time, increasing accuracy, and enhancing design objectivity.

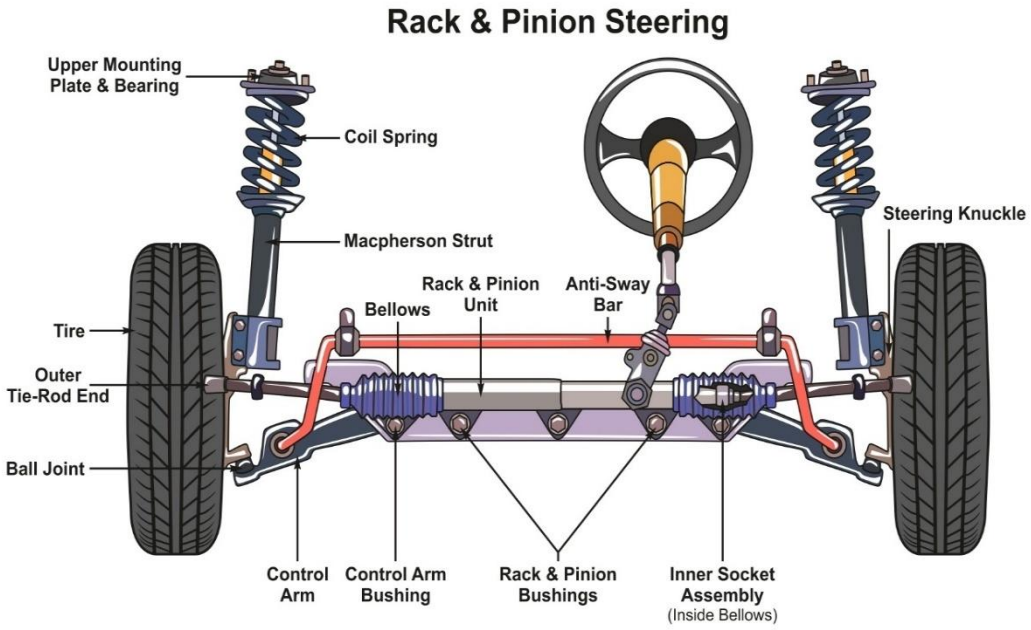
As a result of this research, three main approaches to automating the kinematic analysis of suspension systems have been identified:

Approach	Description
Dedicated CAE Software	Integrated commercial programs used to create digital models, analyze motion, and perform finite element analysis (FEA).
Custom Scripting Environments	Modeling and simulation tools (like MATLAB or Python) where engineers write proprietary scripts to solve kinematic equations.
Artificial Intelligence (AI) / ML	Algorithms trained on historical design data to predict optimal hard point locations or generate near-optimal suspension geometries.

CAE systems, such as ADAMS/Car or specialized modules within CAD platforms (e.g., SolidWorks Motion), automate the process by allowing the engineer to define linkages and constraints in a virtual 3D environment (Reimpell, 2001).

- *Functionality:* They automatically calculate geometric changes (e.g., bump steer) and dynamic characteristics (e.g., compliance). They include: creating complex *multi-body dynamics* models; storing and maintaining component libraries; and automatically updating parameter plots based on design changes.





Shutterstock is an example of a system analyzed in such software.

This approach involves using powerful numerical platforms, like MATLAB or Python, to develop tailored code that directly solves the underlying *kinematic equations* (Shigley, 2017).

- *Advantages:* This provides complete flexibility and the ability to implement highly specialized or non-standard design targets. It is highly accessible

from any location and does not require significant investment in specialized commercial licenses.

AI represents a promising new approach. *Generative Design* or *Optimization Algorithms* can be trained on datasets of successful suspension geometries and their performance metrics to predict the best initial design variables for a new vehicle (Chen, 2023).

- *Mechanism:* Algorithms can predict, for example, the optimal placement of the lower control arm pivot points to minimize the *kinematic roll center migration* for a given suspension travel range. This approach reduces the time required for initial design iterations and avoids human bias in complex calculations. However, it requires a significant amount of high-quality training data.

Despite their useful functionality, each of the methodological approaches under consideration has a number of distinct advantages and disadvantages (Table 1).

Method of Automation	**Advantages**	**Disadvantages**
CAE Software	- Integrated 3D visualization and FEA capabilities. - Robust, validated physics engines. - Extensive material and component libraries.	- High cost of software licenses. - Steep learning curve for staff training. - Vendor lock-in; possible compatibility issues.
Custom Scripting	- Complete customization and flexibility for niche problems. - Lower initial investment (often relies on open-source libraries).	- Requires specialized programming skills. - Lack of integrated 3D visualization.

	- Suitable for fast, small-scale calculations.	- Verification and validation must be done manually.
Artificial Intelligence (AI)	- High predictive accuracy and optimization speed. - Ability to simultaneously account for many conflicting performance factors. - Automation of complex, repetitive optimization tasks.	- High cost of development and implementation. - Need for qualified data scientists and engineers. - Dependence on the quality and size of the training dataset.

Automation of suspension kinematic analysis offers immense potential for improving the efficiency and accuracy of the vehicle design process. While *Dedicated CAE Software* currently remains the most robust and widely accepted solution due to its integrated visualization and dynamics capabilities, *Custom Scripting* offers unparalleled flexibility and cost-effectiveness for experienced users. The use of *Artificial Intelligence* has not yet become widespread but shows potential for drastically reducing the initial design time by automating the optimization loop.

In the future, the author foresees a combination of such methods in a so-called *"hybrid approach"*. AI will be integrated into CAE software to propose optimal hard point initial values, thereby significantly increasing the efficiency of using software systems. The key to successful design is choosing the automation method that best suits the specific complexity, budget, and expertise of the engineering team.

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Pashchenko I. V.

TRENDS IN THE DEVELOPMENT OF ROAD TECHNOLOGY IN UKRAINE

Language Advisor – Associate Professor Ahibalova T. M.

The development of road technology in Ukraine is experiencing a rapid transformation driven by global engineering advancements, European integration efforts, and national priorities for transportation improvement. Since the road sector is vital for economic stability, logistics, and mobility, Ukraine must modernize outdated infrastructure and implement high-performance technologies. Over the past decade, the industry has shifted from traditional construction methods to innovative solutions that prioritize durability, safety, and environmental sustainability. Current trends indicate a shift toward digitalization, the use of advanced materials, the adoption of energy-efficient techniques, and improvements in maintenance practices, particularly in light of climate challenges and increasing transportation demands (Cavalli et al., 2023).

One of the major trends is the adoption of advanced pavement materials designed to enhance the performance of road surfaces. Modern Ukrainian road construction increasingly relies on modified bitumen, polymer-reinforced asphalt, and high-density asphalt concrete mixes. These materials provide greater resistance to rutting, cracking, and temperature fluctuations, which is crucial in a country with significant seasonal variations. The use of SBS-modified bitumen and polymer additives helps extend pavement service life and lower maintenance costs. Additionally, cold recycling technologies have become increasingly widespread,

enabling the reuse of reclaimed asphalt pavement and thereby reducing the consumption of natural resources. This approach supports environmental sustainability and aligns with global circular economy practices in the road sector. Alongside material innovations, digitalization has become one of the most transformative forces in Ukraine's road industry. Digital tools such as Geographic Information Systems (GIS), Building Information Modeling (BIM), and automated diagnostic systems enable precise planning, monitoring, and assessment of road conditions. For example, laser scanning technologies help specialists detect pavement deformations, cracks, and structural faults with high accuracy. Ground-penetrating radar is used to evaluate the condition of underlying layers without damaging the road surface. These technologies create detailed digital replicas of road networks, leading to more accurate predictions of deterioration and supporting predictive maintenance. The digital transformation of construction processes also promotes transparent project management and helps reduce human errors.

Another significant trend relates to the development of sustainable and energy-efficient technologies. Worldwide, road construction is moving toward greener options, and Ukraine is also adopting these methods. The use of warm-mix asphalt, which requires lower production temperatures, reduces carbon emissions and energy consumption. New drainage and water-management systems are being implemented to prevent early deterioration caused by moisture infiltration, a main cause of pavement failure. Environmental considerations are also influencing the design of road infrastructure, resulting in the installation of noise-reducing barriers, the adoption of solar-powered lighting, and the development of green corridors along major highways. These initiatives help enhance environmental conditions and promote long-term sustainability in road operations.

Winter maintenance technologies are a key area of development in Ukraine, given its climate, which features long, cold seasons and frequent temperature fluctuations. Modern strategies focus on optimizing the use of de-icing materials, utilizing advanced equipment, and integrating meteorological monitoring systems.

Automated weather stations placed along major roads gather real-time data on temperature, humidity, wind speed, and surface conditions. This information aids prompt decisions on applying anti-icing agents and snow removal techniques. Specialized machinery, such as multi-functional snowplows, GPS-controlled salt spreaders, and brine application systems, improves winter road service efficiency. Consequently, weather-related accidents decline, and the durability of road surfaces is extended by reducing the harmful effects of excessive salt usage.

Along with technological advancements, Ukraine is actively adopting modern standards in road design and quality control. Transitioning to European norms, particularly EN standards and Eurocodes, has resulted in more stringent requirements for pavement structural design and traffic safety components. These standards focus on durability and long-term performance, ensuring roads meet high safety standards. Quality control during construction has been enhanced through the use of laboratory testing of materials, on-site inspection procedures, and automated quality verification tools. These measures help ensure project specifications are met and boost the reliability of newly constructed roads.

Furthermore, smart transport systems are increasingly integrated into the Ukrainian road infrastructure. Intelligent Transportation Systems (ITS) encompass automated traffic control systems, variable-message signs, speed monitoring devices, and smart pedestrian crossings. These technologies aim to reduce traffic congestion, improve safety, and provide drivers with real-time information. Implementing smart road elements is especially effective in urban areas and on heavily used highways. Over time, Ukraine is expected to expand these technologies nationwide, helping to develop a unified digital transport ecosystem.

Another trend worth noting is the modernization of road machinery and equipment. Construction companies are gradually replacing outdated machinery with modern, high-precision equipment such as automated asphalt pavers, high-efficiency rollers, 3D-controlled graders, and GPS-guided compaction systems. This equipment enhances accuracy, reduces labor intensity, and increases productivity (Cavalli et al.,

2023). The use of drones for construction monitoring and surveying has also become more common, providing high-resolution photos and videos that support informed decision-making and improve project supervision. Modern machinery not only boosts the quality of construction but also shortens project timelines and lowers operational costs.

A key aspect of road development in Ukraine is the increasing focus on road safety technologies. Road safety audits, better signage, guardrail updates, and the addition of energy-absorbing barriers help lower accident rates. Modern pavement marking materials with higher reflectivity offer improved visibility at night and in adverse weather conditions. The installation of pedestrian refuge islands, smart crosswalks, and improved lighting helps create safer urban and rural road environments. Safety measures are now incorporated into every stage of design and planning, reflecting the best global practices.

The use of innovative road-surface technologies continues to expand. For example, ultra-thin asphalt overlays and micro-surfacing techniques are used to extend the lifespan of existing pavements without requiring full reconstruction. These methods are cost-effective and enable quick restoration of pavement function. Furthermore, cement-treated base layers, geotextiles, geogrids, and other reinforcement materials enhance the structural integrity of pavement systems. These solutions help distribute loads more evenly, reduce deformation, and decrease the frequency of repairs.

Overall, current trends in road technology development in Ukraine show a clear shift toward modern, efficient, and sustainable solutions. The sector is benefiting from the adoption of advanced construction materials, digital planning tools, smart infrastructure components, and environmentally responsible practices. Winter maintenance technologies, enhanced safety systems, and upgraded machinery further improve the reliability and resilience of the road network. As Ukraine continues to integrate into the European transport system, investment in innovative technologies and compliance with international standards will remain crucial. These

trends collectively establish the foundation for a modern, durable, and safe road infrastructure that can support economic growth and meet society's mobility needs.

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Saienko V. O.

RESOURCE-EFFICIENT DOUBLE-GAS-SHIELDED WELDING OF ALLOY STEELS: EFFECT OF MODES ON STRUCTURE AND MECHANICAL PROPERTIES

Scientific Advisor – D.Sc. (Engineering), Prof., Stolbovyi V. O.
Language Advisor – D.Sc. (Education), Prof. Saienko N. V.

Introduction

Medium carbon alloy steels have a high set of operational properties and are used for the production of critical welded structures (Migal et. al, 2021; Hlushkova et al., 2023; Hlushkova & Volchuk, 2023; Frye & Coniglio, 2020). They provide high structural strength while simultaneously reducing its metal consumption. However, under the influence of the thermal cycle of welding (Liu & Olson, 2019; Kim & Kim, 2021), hardened structures are formed in the heat affected zone (HAZ) of welded joints, characterized by high hardness values at low viscosity (Kapustka et al., 2020; Kalinina et al, 2019). Therefore, the HAZ accounts for the largest share of cold cracks formed during the welding process (Bhadeshia & Honeycombe, 2017).

Purpose and task statement

The aim of the work is to improve the welding process with a consumable electrode in a shielding gas environment and thereby investigate the structure and properties of non-separable joints.

To achieve the goal, the following tasks were defined:

1) to determine the degree of influence of the active shielding gas jet on the chemical composition and geometry of the weld metal;

2) to investigate the basic patterns of formation of the structure and properties of non-separable joints depending on the technological parameters of welding with a consumable electrode with double-jet gas protection, under which the stability of high operational properties is ensured.

Materials and methods of the study

The study was conducted on medium-carbon alloy steel 30KhGSA, widely used in high-strength welded structures. The following materials were used: pipes with 90 mm diameter and 20 mm wall thickness; groove preparation – 8 mm slot; welding wire Sv-08G2S, 0 1.2 mm.

Two welding technologies were compared:

Method 1 – Traditional consumable-electrode arc, welding in CO2; preheating to 350 °C; post-weld heat treatment at 600 °C.

Method 2 – Developed arc welding in double-jet gas shielding; no preheating; no heat treatment.

Equipment to be used: welding power source TDFZh-1000; automatic welding head A-1420; shielding gas – CO2; metallographic microscope NEOPHOT-21; microhardness tester PMT-3.

The developed method provided the following: the inner active gas jet increased melt stirring; the outer annular jet stabilized protection and reduced turbulence. In both methods, mechanized multilayer welding of the pipe joint was performed.

The traditional method applied a full thermal cycle, while the developed method ensured accelerated cooling due to modified gas flow dynamics.

The following structural zones were analyzed: weld metal; fusion zone; incomplete fusion zone; overheating zone; normalization zone; base metal. Microhardness was measured 5 mm below the upper surface of the weld.

Measurement error: ±5-7%.

Influence of technological parameters of fusion welding in jet gas protection on the properties of welded joints

Structural alloyed steels include steels alloyed with one or more elements with a total content of 2.5 – 10%. Modern alloyed steels are characterized by multicomponent complex alloying, which allows steels with high mechanical properties to be obtained. Alloyed steels used for welded structures mainly belong to the pearlitic class.

For a comparative assessment of the operational properties of welded joints made of 30KhGSA alloy steel, experimental studies were conducted using the following welding methods:

1. The basic (traditional) method – stationary arc welding with preheating to a temperature of 3500 °C and subsequent heat treatment at a temperature of 6000 °C.

2. The developed method – stationary arc welding with double-jet gas protection without preheating and heat treatment.

Figure 1 shows a graph of the change in microhardness in the cross section of the welded joint obtained by method 1. The measurement was carried out at a distance of 5 mm from the upper surface of the welded joint. The graph shows that the microhardness in the HAZ has an increased value compared to other areas (Frye & Coniglio, 2020).

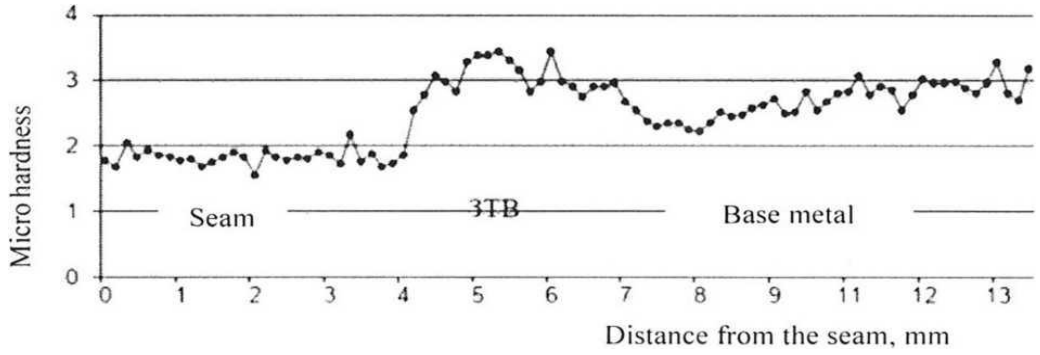

Fig. 1. Change in microhardness in the cross section of a welded joint made by method 1

The average values of the microhardness of the weld metal, heat-affected zone, and base metal are 1824, 3091, and 2823 MPa, respectively.

Figure 6 shows the change in microhardness in the cross section of a welded joint obtained by welding with double-jet gas protection. The measurements were carried out at a distance of 5 mm from the upper surface of the welded joint.

The results of the experiment show that the microhardness in the HAZ also increases compared to other areas, for example, in relation to the base metal it increased by approximately 19%, taking into account the measurement error. The average values of the microhardness of the weld metal, the heat affected zone and the base metal are respectively: 1952, 3481, 2913 MPa. The relative error is ±7 %.

Conclusions

It has been established that the use of double-gas- shielded welding in a CO2 environment ensures the formation of a stable ferrite-pearlite structure in the weld metal with a smaller grain size compared to the traditional welding method involving preheating and post-weld heat treatment.

Welded joints produced using the double-gas-shielding technology demonstrate higher mechanical properties – static strength, microhardness of the weld metal and heat-affected zones, thus indicating improved strengthening and reduced tendency to form brittle structures.

The proposed welding technology is resource- and energy-efficient, as it eliminates the need for preheating and post-weld heat treatment while maintaining high quality and performance of welded joints.

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NATURAL SCIENCES

Bessmertna D. O.

INFLUENCE OF EXTREME WEATHER PHENOMENA ON THE STRUCTURE AND HUMUS STATE OF CHERNOZEMS AND THE POSSIBILITIES OF THEIR RESTORATION

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Language Advisor – CandSc (Education), Assoc. Prof. Borzenko O. P.

Ukraine's chernozems are a unique natural resource, the fertility of which has been shaped over millennia by rich herbaceous vegetation, moderate moisture, and well-developed biogeochemical processes. However, in recent decades, they have been increasingly under pressure from extreme weather conditions associated with climate change. The increase in the frequency and intensity of droughts, heat waves, sudden downpours and abnormal snow melting affects the structural state of chernozems, their water resistance, humus accumulation and ability to self-restore (Лісовий, 2020). Collectively, this leads to soil degradation, changes natural soil formation processes, and poses a threat to agricultural production.

Droughts are one of the most common extreme phenomena in the steppe and forest-steppe zones of Ukraine. According to climate observations, long periods without precipitation with high temperatures lead to deep drying of the upper soil horizons, which causes the destruction of its aggregates, a decrease in porosity, and an increase in the density of the assembly (Zhang & Nearing, 2018). In chernozems, which typically have a high proportion of stable aggregates, during prolonged droughts, particle cohesion decreases, the microbiota enters a state of suppression, and the organic matter mineralization accelerates. This directly affects the reduction of humus content, the main factor in soil fertility. Research by Ukrainian soil scientists has documented that, during repeated droughts, humus content can decrease by 0.05–0.15 % annually, depending on the type of land use (Ковальчук,

2019). At the same time, moisture capacity decreases, which increases the risks of further degradation processes.

No less dangerous for the structure of chernozems are extreme downpours, which are becoming more frequent due to changes in climatic regimes of atmospheric circulation. Sudden high-intensity precipitation causes surface runoff, which washes away the most fertile humus horizon, causes destruction of the soil structure and the formation of erosion furrows and ravines. This problem is most acute on sloping lands: up to 20–40 t/ha of soil can be lost during a single heavy downpour. The destruction of aggregates due to the impact force of rain contributes to the formation of a soil crust, which limits air access and water infiltration. As a result, chernozems, which effectively accumulate moisture under normal conditions, lose their natural stability and ability to quickly restore their structure.

It is worth noting separately the impact of heat waves – long periods with temperatures significantly higher than the annual average. In Ukraine, the number of such periods has more than doubled over the past 20 years (IPCC, 2026). At this time, the mineralization of organic matter in chernozems accelerates, and microorganisms shift their metabolism towards the active decomposition of humus. When these processes are repeated from year to year, the soil loses the stability of humic structures, and the ratio of humus and non-humus forms of carbon deteriorates, which affects its agrophysical properties. Long-term overheating of the upper layer also changes the ecological niches of soil fauna: the number of earthworms, mites, and other soil structuring bioagents decreases (Черниш, 2021).

A significant consequence of extreme winter conditions is the abrupt changes in soil freezing and thawing processes. When chernozems experience repeated freeze-thaw cycles, their aggregates weaken, and the capillary-pore space is destroyed. The rapid melting of snow in a short period of time contributes to water erosion and the formation of wash furrows. This not only results in the physical loss of the upper layer, but also the leaching of humus substances, which in the long term worsens soil fertility.

All these processes cause an objective need to develop measures to restore the structure and humus state of chernozems. One of the most effective approaches is the restoration of organic matter through the systematic application of composts, siderates, manure, and biochar. Organic materials improve the aggregate structure of the soil, increase the proportion of water-resistant aggregates and promote the development of microbiota involved in humus formation (Lehmann & Joseph, 2015). Biochar, which has been actively researched in Ukraine in recent years, is capable of stabilizing organic carbon, increasing cation exchange capacity, and forming long-lasting humic structures.

The second important strategy is the implementation of soil-conserving farming technologies: minimal or no-tillage, mulching, strip cropping and crop rotation. Such methods reduce the risk of aggregate destruction, promote moisture accumulation, and activate biological processes in the soil, which generally increases its resistance to extreme phenomena (Дегодюк, 2018). In addition, the implementation of adaptive crop rotations with the inclusion of legumes allows enriching soil with organic nitrogen, maintaining structure, and promoting humus growth.

Anti-erosion measures also play an important role: the creation of forest belts, contour farming, slope terracing, and regulation of surface runoff. They allow minimizing negative impact of intense rainfall and reduce the loss of fertile layer. In combination with organic fertilization and rational land cultivation, such measures ensure long-term restoration of chernozems.

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CARBON-RICH EXOPLANETARY DISKS AS POTENTIAL MOON FACTORIES: INSIGHTS FROM THE JAMES WEBB SPACE TELESCOPE

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Recent discoveries from the James Webb Space Telescope (JWST) have revealed a carbon-rich circumplanetary disk surrounding the exoplanet CT Cha b, located approximately 625 light-years from Earth. This finding challenges traditional models of satellite formation and suggests that carbon-based chemistry may play a pivotal role in the development of moons beyond our solar system. This article explores the implications of this discovery for planetary system evolution, moon formation mechanisms, and astrobiological potential.

The formation of natural satellites – moons – is a cornerstone of planetary system evolution. In our solar system, the Galilean moons of Jupiter and the icy satellites of Saturn exemplify the diversity and complexity of satellite systems formed in silicate-rich, gas-dominated environments. Traditional models of moon formation rely on the presence of circumplanetary disks composed primarily of silicates, ices, and trace volatiles, where accretion and gravitational interactions give rise to stable satellite orbits.

However, recent observations from the James Webb Space Telescope (JWST) have challenged this paradigm. The detection of a carbon-rich circumplanetary disk surrounding the exoplanet CT Cha b – located in the Chamaeleon I star-forming region approximately 625 light-years from Earth – suggests that satellite formation may occur under radically different chemical conditions. This discovery raises fundamental questions about the diversity of moon-forming environments and the role of carbon-based compounds in shaping planetary architectures.

Carbon-rich disks, previously considered inhospitable to satellite formation due to their volatile nature, may in fact promote rapid grain coagulation and enhanced accretion efficiency. The presence of complex organic molecules such as polycyclic aromatic hydrocarbons (PAHs) and carbon monoxide within the disk implies a chemically active environment capable of supporting prebiotic chemistry. These findings not only expand our understanding of planetary system formation but also open new avenues for astrobiological exploration.

This article investigates the implications of carbon-rich circumplanetary disks for moon formation, drawing on recent JWST data and theoretical models. It explores how carbon chemistry may influence disk dynamics, accretion processes, and the potential habitability of resulting satellites. By integrating astrophysical observations with planetary science and astrobiology, we aim to provide a comprehensive framework for understanding this emerging frontier in exoplanetary research.

The James Webb Space Telescope (JWST), equipped with the Near-Infrared Camera (NIRCam) and Mid-Infrared Instrument (MIRI), has revolutionized our ability to observe distant planetary systems with unprecedented clarity. In the case of CT Cha b, JWST captured high-resolution imaging and spectroscopic data that revealed the presence of a circumplanetary disk rich in carbon-based compounds.

Spectral analysis identified strong emission features corresponding to polycyclic aromatic hydrocarbons (PAHs), carbon monoxide (CO), and other organic molecules. These compounds are typically associated with high-temperature regions, yet the disk surrounding CT Cha b exhibits a relatively cool and stable

structure. This suggests that carbon-rich chemistry can persist in environments conducive to accretion and satellite formation.

The disk's morphology, inferred from infrared imaging, indicates a flattened, rotating structure with sufficient mass to support the formation of multiple moonlets. The presence of carbon-rich volatiles may enhance grain adhesion, facilitating the rapid growth of solid bodies. These observations challenge the assumption that silicate-dominated disks are the only viable sites for satellite formation and open new avenues for modeling disk dynamics in chemically diverse environments.

JWST's data were cross-referenced with archival observations from the Very Large Telescope (VLT) and the Atacama Large Millimeter/submillimeter Array (ALMA), confirming the persistence and composition of the disk over time. This multi-instrument approach strengthens the reliability of the findings and provides a robust foundation for theoretical modeling.

The discovery of a carbon-rich circumplanetary disk around CT Cha b introduces a compelling alternative to traditional moon formation models. In silicate-dominated environments, satellite formation typically proceeds through the gradual accretion of dust and ice particles, driven by gravitational instabilities and disk viscosity. However, the presence of abundant carbon-based compounds in CT Cha b's disk suggests that chemical composition may play a more active role in shaping satellite systems.

Carbon-rich molecules such as polycyclic aromatic hydrocarbons (PAHs) and carbon monoxide (CO) can influence the physical properties of dust grains, enhancing their stickiness and promoting rapid coagulation. This could accelerate the formation of moonlets, even in regions with lower overall mass density. Additionally, carbon compounds may contribute to the thermal regulation of the disk, maintaining conditions favorable for accretion over extended periods.

The implications extend beyond formation speed. Moons born in carbon-rich environments may exhibit distinct mineralogies, surface chemistries, and internal structures compared to their silicate-rich counterparts. These differences could affect

their geophysical evolution, potential for retaining atmospheres, and capacity to support subsurface oceans or organic chemistry.

Furthermore, the detection of such disks challenges the assumption that moon formation is limited to massive gas giants. If carbon-rich disks can form around lower-mass exoplanets, the prevalence of satellite systems in the galaxy may be significantly higher than previously estimated. This has profound consequences for models of planetary system architecture and the search for habitable worlds.

The presence of carbon-rich circumplanetary disks has profound implications for astrobiology. Moons formed in such chemically diverse environments may possess surface and subsurface conditions conducive to prebiotic chemistry. The abundance of organic molecules like PAHs and CO suggests that these satellites could host complex chemical reactions, potentially leading to the emergence of life-supporting environments.

Moreover, carbon-rich moons may retain atmospheres or subsurface oceans more effectively than their silicate-rich counterparts, depending on their mass and thermal history. These features make them compelling targets for future observational campaigns and interstellar missions focused on detecting biosignatures beyond Earth-like planets.

From a broader perspective, the discovery of CT Cha b's disk invites a reevaluation of the criteria used to define habitable zones. If moons can form and sustain life-supporting conditions in carbon-rich environments, the search for extraterrestrial life must expand to include satellite systems around diverse exoplanets. This shift could dramatically increase the number of potential biospheres in the galaxy.

In conclusion, the James Webb Space Telescope's detection of a carbon-rich circumplanetary disk around CT Cha b marks a pivotal moment in exoplanetary science. It challenges established models of moon formation, highlights the role of carbon chemistry in planetary evolution, and opens new frontiers in the search for life. As observational technologies advance, the study of such disks will become

central to understanding the diversity and complexity of planetary systems across the universe.

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THE IMPACT OF MICROPLASTIC NANOPARTICLES ON THE FUNCTIONING OF AQUATIC ECOSYSTEMS AND HUMAN HEALTH

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The problem of environmental pollution by microplastics has become particularly relevant in recent years, but it is microplastic nanoparticles that cause the greatest concern among scientists. Unlike larger fragments, nanoparticles, which range in size from a few to hundreds of nanometers, have unique properties: high

surface area, significant reactivity, and the ability to penetrate the natural barriers of living organisms (Gigault, 2018).

The main sources of nanoplastics entering water are the disintegration of larger plastic objects under the influence of ultraviolet radiation, abrasion and biological processes, as well as industrial wastewater, cosmetics, synthetic textile fibers and insufficiently efficient wastewater treatment systems (Amobonye, 2021).

Aquatic microorganisms are the first to encounter nanoparticles in the natural environment. Studies show that nanoplastics can change the composition of the water microbiota, as their surface creates conditions for the formation of the so-called "plastisphere" – a biofilm with a different structure than on natural substrates (Amobonye, 2021). Pathogenic bacteria or microorganisms capable of invasion can multiply on such films, posing additional risks for biodiversity. In addition, nanoparticles interfere with normal photosynthesis processes in phytoplankton and can reduce algae productivity, which directly affects the primary production of the ecosystem.

When entering zooplankton, mollusks and small crustaceans, nanoplastics disrupt food filtration mechanisms, reduce activity, cause oxidative stress and can affect the reproductive capacity of organisms (Habumugisha, 2024). Particles of this size are capable of penetrating tissues and cells, enhancing the toxic effect. Some studies demonstrate intracellular accumulation of nanoparticles, which can lead to apoptosis and chronic inflammation. Since small organisms are the basis of food chains, the impact of nanoplastics on them leads to effects that "spread" up the trophic levels – to fish, predators and ultimately humans (Amobonye, 2021).

The chemical properties of nanoplastics pose a particular danger. In addition to their own toxic additives (phthalates, plasticizers, stabilizers), they actively adsorb heavy metals and persistent organic pollutants. Thus, in the environment, nanoplastics become a kind of “carrier” of toxic substances, increasing their mobility and bioavailability (Habumugisha, 2024). This explains why, in experimental

studies, the effects of nanoplastics are often accompanied by a stronger toxic effect than would be expected from the polymer alone.

The issue of risk to human health is one of the most controversial, since nanoparticles enter the body in different ways: through the consumption of seafood, drinking water, inhalation of particles in the air, and even through some household products, such as tea bags, which release micro- and nanoparticles when heated. Recent studies have reported the detection of plastic particles in human tissues, blood, and even atherosclerotic plaques, which may suggest their ability to circulate in the body and participate in inflammatory and vascular processes. Although a direct cause-and-effect relationship has not yet been established, associations between plastic exposure and the risk of cardiovascular and metabolic disorders raise legitimate concerns. The most likely mechanisms of impact are considered to be oxidative stress, systemic inflammation, disruption of cell membranes, and endocrine effects (Otorkpa, 2024).

Despite significant progress in microplastic research, the scientific community has faced a number of methodological challenges: the difficulty of accurately measuring nanoparticles in natural samples, the high risk of laboratory contamination, the lack of unified analysis methods, and even differences in the definition of the term “nanoplastic” between different authors (Wright & Kelly, 2017). This creates difficulties in comparing results and hinders the development of uniform safety standards.

A comprehensive approach is needed to minimize the impact of nanoparticle microplastics. It includes reducing the volume of single-use plastics, developing wastewater treatment technologies, researching alternative biodegradable materials, improving analytical and monitoring methods, and raising public awareness of risks and practices to reduce personal impact (Amobonye, 2021). Modern environmental policy is increasingly focused on preventive and systemic solutions, but a real reduction in potential risks requires a combination of scientific, state, and societal efforts.

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PROBLEMS OF BIOLOGICAL AND CHEMICAL POLLUTION OF WATER AND OXYGEN

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Nowadays, there are a large number of factors that affect not only the nature surrounding us, but also ourselves. The statistics of people suffering from asthmatic diseases is only growing every year. One of the main problems associated with such diseases is the emission of harmful substances and the subsequent absorption of these impurities by the atmosphere, hydrosphere, and lithosphere, which, through transmission routes, directly reach us.

Due to these unpleasant consequences, there are a number of special facilities that help reduce the harmful impact on the environment. Firstly, it is an adequate understanding of the situation and simple adherence to the rules regarding cleanup measures. Secondly, it is important to understand that treatment facilities do not operate continuously without waste – it is necessary to control not only external processes outside the facilities, but also always remember about internal blockages.

Biological water pollution is, directly, the introduction of pollution into the aquatic environment and the reproduction of organisms that are undesirable to

humans in it. For example, the spread of many pathogenic microorganisms (viruses, bacteria, etc.), flowering weeds, animals that harm human economic activities (rats, mouse-like rodents, locusts, etc.).

Some of the main sources of biological pollution of surface waters are considered to be wastewater from food and leather industries, domestic and industrial landfills, cemeteries, sewage systems, and others. Not only surface and groundwater are polluted, but also soils and rocks are also susceptible to pollution. Pathogenic E. coli is found in groundwater at depths of up to 300 m below the earth's surface (Гончарук, 2014).

The discharge of warm water from nuclear and thermal power plants raises the overall temperature of the reservoir. This leads to accelerated algae growth and the death of aquatic life.

The spread of AIDS is also related to problems due to water pollution, one of the causes, the first link in the chain of possible epidemics of previously unknown viral diseases. Due to the increase in various microorganisms, fungi, and algae in the water, this leads to an increase in the concentration of inorganic and organic substances. An example is phosphorus compounds, which cause “blooming” of river water.

The consequences of pollution can be described as dangerous and comprehensive. Here are some of them:

- reduction in the diversity of marine and river flora and fauna;
- deterioration in the taste, colour and smell of water;
- destruction of our tooth enamel due to excess fluoride in water;
- outbreaks of hepatitis caused by bacteria and E. coli.

Chemical pollution of water is a change in the natural properties of water due to an increase in harmful organic and inorganic impurities.

Every water body and water source is connected to the environment. Influencing factors may include natural phenomena, transportation, municipal and industrial construction, human economic and domestic activities, and many others.

After such dangerous impacts, pollutants that are completely foreign to the aquatic environment enter it, which degrade its quality.

Most often, drinking water samples reveal deviations in organoleptic indicators, which amount to 72%, followed by mineralization in second place, which exceeds the norm by up to 28%, and in third place is the exceeding the limit concentration of chemical substances, which is approximately 16%.

In drinking water samples, the most common difference observed is in organoleptic indicators, which is 70%. Mineralization, which does not meet the standards, is 16%, and then there is a high concentration of chemicals – 14% (Колонін, Герасимов & Морозов, 1992).

Biological pollution mainly refers to microbial pollution. For example, air pollution occurs due to vegetative forms and spores of bacteria and fungi, viruses, as well as their toxins and waste products.

Biological pollution is understood as the introduction of non-typical species of living organisms (bacteria, viruses, etc.) into ecosystems as a result of anthropogenic impact, which can worsen the living conditions of biotic groups or negatively affect human health. A particular danger is biological pollution of the environment by pathogens of infectious and parasitic diseases.

Biological pollution is most often caused by microorganisms, including pathogenic organic substances capable of fermentation. Biological pollution causes various diseases in humans. They can be found in the atmosphere, water, soil, and the bodies of other living organisms, including humans.

Chemical smog, which is a visible haze of corrosive gases (typical for cities such as Los Angeles), appears due to the effect of solar radiation on nitrogen oxides and hydrocarbons. Smog hangs in the atmosphere and does not dissipate due to temperature inversions. Studies in the US have shown that during smog, asthmatics suffer more frequent attacks and are hospitalized.

Chemical pollution of oxygen is the pollution of the atmosphere with substances such as gases and aerosols.

Regarding the aggregate state of emissions into the atmosphere, harmful substances are classified into the following subgroups:

- solid (lead and its compounds, organic and inorganic dust, soot, resinous substances, carcinogenic substances and others);
- gaseous (nitrogen oxides, carbon monoxide, sulfur dioxide, and others);
- liquids (solutions of salts, acids, etc.).

When talking about atmospheric pollution, we should understand the change in its composition due to the introduction of impurities of natural or anthropogenic origin. There are three types of pollutants: gases, dust, and aerosols. Aerosols include dispersed (finely ground) solid particles that are emitted into the atmosphere and remain there for a long time.

The main contribution to the high level of air pollution is made by enterprises of non-ferrous and ferrous metallurgy, chemistry and petrochemicals, construction industry, energy, paper industry, and sometimes heating plant.

Some of the main sources of unnatural aerosol air pollution are thermal power plants, metallurgical, cement, and carbon black factories, and enrichment plants. Such enterprises consume high-ash coal. Aerosol particles from these sources are characterized by a greater diversity of chemical composition. Most often, aerosol particles contain compounds of calcium, silicon, and carbon, and somewhat less frequently, metal oxides: for example, magnesium, zinc, manganese, iron, nickel, copper, and lead.

All these harmful substances are contained in emissions from ferrous and non-ferrous metallurgy industry, thermal power plants, in the remains of building materials, as well as in road transport.

Thus, the presented problems with pollution of water biota and oxygen by biological and chemical species, which contribute to many different consequences for both humans and all living organisms, as well as for the environment as a whole, were considered. Ways to solve the problems of reducing the negative impact on the Earth's shell can be considered the use of methods for capturing impurities at

enterprises using special structures and the development of possible methods for further disposal of harmful substances.

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Pavlenko R. V.

THE INFLUENCE OF MUSIC AND HUMAN EMOTION ON THE STRUCTURE OF WATER: MASARU EMOTO`S CONCEPT

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Water is a remarkable mirror of the world, capable of responding to the subtlest vibrations of human emotions. The idea that water can respond to human emotional states and the impact of music became widely discussed after the publications of Japanese researcher Masaru Emoto. His experiments photographing ice crystals and his hypothesis that water can perceive information generated considerable interest and controversy. Some view Emoto as an innovator, others as a popularizer of pseudoscientific concepts. Nevertheless, his work continues to influence popular culture, philosophy, and environmental thinking.

Masaru Emoto began studying water based on the hypothesis that it could store and transmit information. He postulated that water responded to various types of energy – sound vibrations, words, emotions, and mental messages – and that these influences were reflected in the structure of ice crystals.

Emoto's method included:

• influencing water with music, words, or emotions;

• rapid freezing at low temperatures;

• microscopic analysis of ice crystals;

• photographing the resulting structures.

According to him, symmetrical and beautiful crystals are formed under the influence of positive emotions and harmonious music, while negative influences lead to chaotic, asymmetrical forms.

Emoto experimented with various musical genres. He claimed that:

• Classical music promotes the formation of harmonious, symmetrical crystals;

• Folk and spiritual chants evoke soft and orderly structures;

• Heavy and aggressive music leads to disrupted, unsystematic forms.

Experiments with words included pasting messages like "love," "thank you," "hate," and "I don't like you" onto containers. Positive words, according to Emoto's observations, induced the formation of beautiful, clear crystals, while negative ones produced distorted and asymmetrical ones.

In experiments where groups of people directed thoughts of love or gratitude at water, Emoto observed a particularly harmonious crystalline structure. He believed that emotions have an energetic nature that affects water molecules.

The results of these experiments led to the development of the fundamental principles of his concept:

1. Everything in the Universe is a vibration.

2. Emotions and thoughts possess energetic frequencies.

3. Water is a sensitive carrier of information.

4. Positive emotions create harmonious structures, while negative ones destroy them.

5. The shape of crystals reflects the quality of emotional impact.

These ideas combine elements of Eastern philosophy and non-scientific energy theories.

However, the scientific community points out that:

• the experiments were not conducted under double-blind conditions,

• the selection of photographs was subjective,

• the results are difficult to reproduce.

Furthermore, modern chemistry does not confirm the existence of long-term "water memory." Water molecules chaotically rearrange themselves trillions of times per second, making stable storage of information in the form described by Emoto impossible.

Attempts to replicate Emoto's experiments under controlled conditions have not yielded consistent results, casting doubt on the scientific validity of his findings.

However, even in the absence of rigorous evidence, Emoto's ideas have played a significant cultural role.

Emoto's work emphasizes the importance of the following aspects:

• the influence of words on a person's psychological state;

• the role of emotions in shaping personal and social atmospheres;

• the need to maintain inner harmony.

Even if water does not respond literally to emotions, belief in such a possibility contributes to:

• emotional control;

• increased attention to words;

• the development of positive rituals and meditative practices.

At the same time, modern neuroscience proves that music:

• alters hormonal levels;

• influences heart rate;

• reduces stress levels;

• influences emotions and cognitive processes.

Therefore, the idea of music's harmonizing effect on humans has a solid scientific basis, even if the reaction of water remains controversial.

Masaru Emoto's work played a significant role in popularizing the idea of the impact of music and emotions on the structural state of water. Despite criticism and

a lack of scientific evidence, his research has become an important part of modern popular culture, philosophy, and environmental thinking.

Emoto's idea can be seen as a metaphor, emphasizing that a person's emotional state influences the environment, interpersonal relationships, and their own health. His work encourages reflection on the power of words, emotions, and inner harmony.

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THE ROLE OF ORGANIC FARMING IN ADAPTATION OF CHERNOZEMS TO CLIMATE CHANGE

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Organic farming is currently becoming one of the key areas of transformation in Ukraine's agricultural sector, especially in the face of increasing climate change. Chernozems, traditionally considered perhaps the most valuable national resource, are increasingly facing degradation, a decrease in humus content, compaction, a drop in moisture retention capacity, and accelerated mineralization of organic matter. That is why the issue of adapting soils to new climatic realities is no longer considered something distant – it is an urgent task, the solution to which depends on the sustainability of agriculture and the country's food security. Organic farming is one of the promising areas of agricultural development, as this area allows for

significantly reducing the mineral impact on the soil and growing environmentally friendly products (Марчук, Березюк, 2010).

Human agricultural activity changes the natural course of humus formation and humus accumulation, the quantity and quality of the mass of organic matter entering the soil, and the intensity and direction of humification processes. Global climate change can accelerate or slow down these processes (Дегтярьов, Щербаков, 2023). Organic farming is based on the principles of reducing anthropogenic load and restoring natural fertility mechanisms. Unlike intensive farming, which for decades relied on the active use of mineral fertilizers and deep mechanical cultivation, the organic approach attempts to return chernozems to their natural self-regulating mode. One of the main effects of this approach is the stabilization of the humus state: by applying organic fertilizers, siderats, composts, and leaving some plant residues on the field, the soil is able to compensate for the loss of organic matter, which is quickly destroyed by high temperatures and lack of moisture.

Currently, warming in Ukraine is already 1–1.5 °C and approaching 2 °C, and there are no regions with limited heat reserves for growing warm-season crop crops (corn, soybeans). At the same time, rapid and excessive heat accumulation shortens the growing season, promotes early maturation of various plants, and can lead to reduced yields (Василенко, Аверчев, 2022). In the context of climate change, it is important that organic technologies mitigate the effects of erosion and drought. In chernozems, where there are sufficient biological activity and organic mass, a more pronounced structure is formed: aggregates are formed that better retain water and provide aeration. This is critical for areas where precipitation is decreasing and summer temperatures are increasing. The better the soil structure, the slower it dries out, and the better the plant's root system can withstand stress.

The organic approach also changes the role of soil biota. Microorganisms, fungi, earthworms, and other representatives of soil ecosystems become active participants in the processes of transforming organic matter, stabilizing humus, and improving the availability of nutrients. Under traditional farming conditions, this

biota is significantly suppressed, while the organic approach creates optimal conditions for it and thereby strengthens the natural mechanisms of fertility restoration.

Organic farming methods also improve soil state and fertility without the use of chemically synthesized fertilizers. Weed and pest control is carried out without the use of toxic pesticides, thereby protecting land and water resources from contamination by toxic compounds. Mandatory application of crop rotation, use of seeds and species adapted to local conditions, and restoration of functional biodiversity contribute to further strengthening of the ecological balance (Клітна, Брижань, 2013).

A significant argument in favor of organic farming is the increase in the carbon balance of soils. As organic matter accumulates, chernozems act as a natural carbon reservoir, which is important for the formation of climate-neutral farming systems. The higher the humus level, the more carbon remains in the soil rather than being released into the atmosphere as CO_2.

Organic farming is not just an alternative to traditional technologies, but a comprehensive approach that takes into account both agroecological and climatic realities. It allows chernozems not only to preserve their unique properties, but also to adapt to increasing climatic challenges.

Active promotion of organic farming and compliance with environmental standards in all aspects of agricultural activity, taking into account the unique characteristics of land resources, should form the basis for the future development of the agro-industrial complex (Резніченко, Коломієць, Стефанюк, 2024). In the long term, it is organic technologies that can ensure soil stability, ecological balance, and high productivity, which are the foundation for the sustainable development of Ukrainian agriculture.

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ДЛЯ НОТАТОК

Наукове видання СТУДЕНТСТВО. НАУКА. ІНОЗЕМНА МОВА

Збірник наукових праць

Випуск 18
Частина 1

ГУМАНІТАРНІ НАУКИ
СУСПІЛЬНІ НАУКИ
ЕКОНОМІЧНІ НАУКИ
ТЕХНІЧНІ НАУКИ
ПРИРОДНИЧІ НАУКИ

Засновник – Харківський національний автомобільно-дорожній університет

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