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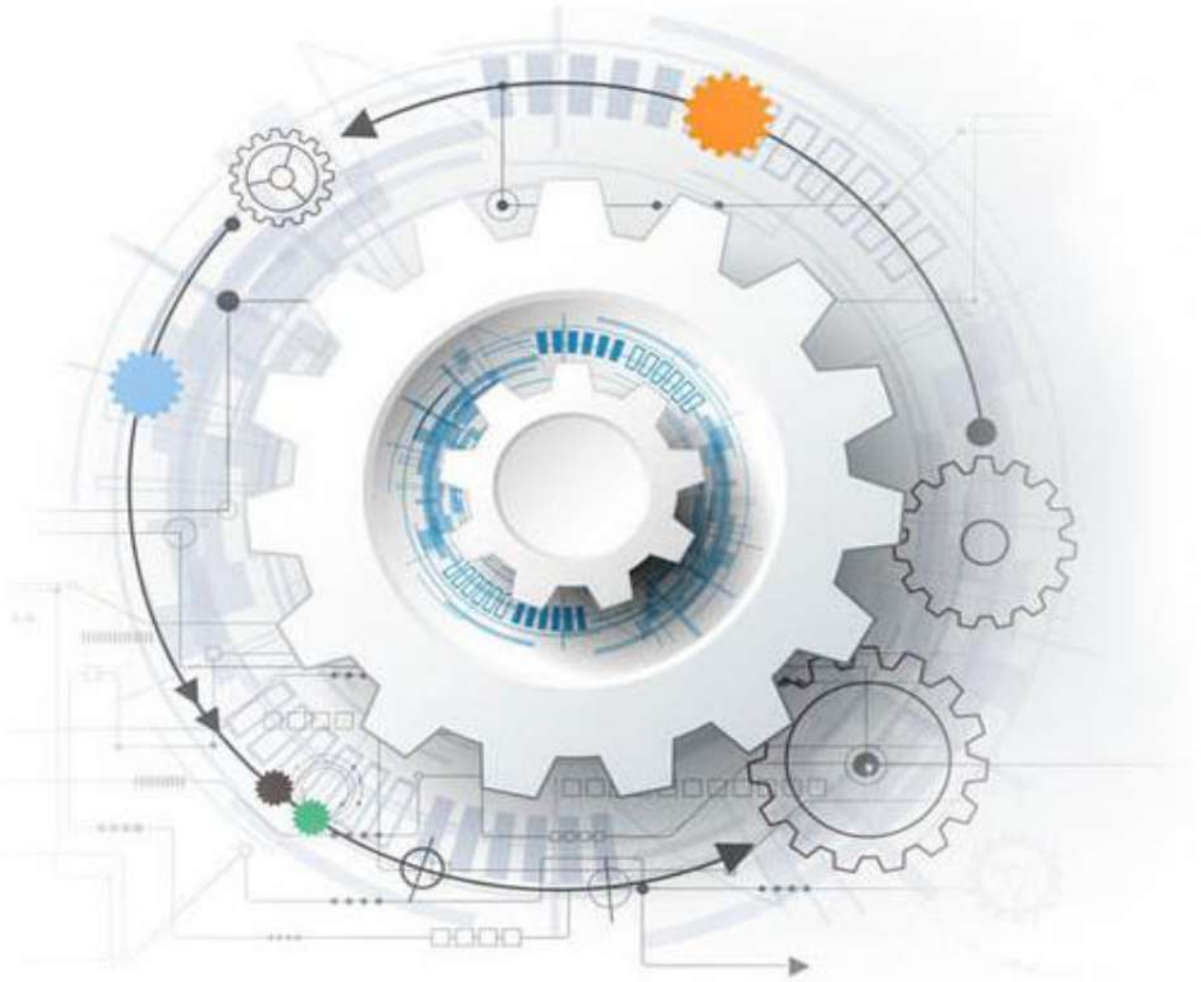

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For students, graduate students, and lecturers.

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TABLE OF CONTENTS

BETWEEN BIOGRAPHY AND FICTION: THE CRISIS OF AUTHORSHIP IN JULIAN BARNES'S *FLAUBERT'S PARROT*

T. Aiupova
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Julian Barnes's *Flaubert's Parrot* may be regarded as a characteristic example of historiographic metafiction, in which the boundary between objective biography and literary invention becomes a matter of critical reflection. Barnes abandons the traditional role of the biographer as an 'archivist of truth' and instead presents the process of approaching the past as a complex intellectual game.

At the centre of the study is the impossibility of grasping the 'true' subject through the mere accumulation of facts. Barnes conveys this idea through the metaphor of a 'net', in which knowledge of the artist appears not as a coherent canvas, but as a structure made up of interlacings and gaps. These epistemological lacunae, burnt letters, silences, and contradictory pieces of evidence, become not obstacles but meaningful semantic points. In Barnes's novel, truth is disclosed not through systematic analysis, but through the accidental, which underscores the fragmentary nature of any biography: the biographer gathers not a life itself, but only its scattered traces.

This crisis of identity finds its fullest embodiment in the figure of the parrot, which becomes a symbol of the multiplicity of literary truths. Instead of a living personality, the researcher encounters only its discursive echoes, as the parrot functions as an ironic 'symbol of the Logos', a pure word detached from its creator. Here Barnes artistically realises Barthes's concept of 'the death of the author': once the writer's voice is separated from his biological and historical existence, the text begins to live an autonomous life in the reader's mind.

The figure of the creator in the novel loses its monolithic quality and is transformed into a system of authorial masks, a conscious self-presentation of the writer through the narrator, which creates a distance from direct utterance and turns biographical research into a subjective game, ultimately undermining the author's authority as a 'bearer of truth'. By introducing the narrator Geoffrey Braithwaite as a mediator, Barnes demonstrates that any biography of another person is simultaneously an attempt at concealed autobiography. The biographer is inevitably subjective: from the boundless ocean of another's experience, he 'fishes out' only those facts and details that are significant to him, thereby transforming the study of the object into a search for his own identity.

Instead of the expected structural logic, Barnes turns to intellectual manipulation, attempting to present chaos as order through the use of pastiche,

the skilful reconstruction of Flaubert's voice, and collage. By incorporating heterogeneous elements, from contradictory chronologies to 'examination papers' and a bestiary, the author deliberately disrupts the linearity of the biographical canon. Such an accumulation of disparate fragments does not produce a coherent picture, but rather confuses the reader within a multitude of subjective versions. This chaos of 'discursive remnants' ultimately demonstrates the futility of any attempt to reconstruct another's life, for instead of truth we encounter only fragmentary traces of the past.

Thus, the study of Barnes's creative laboratory is conditioned by the need to rethink the biographical method in the era of 'post-truth'. Barnes proposes a radical rejection of the very idea of grasping a coherent figure of the author, showing that the truth about the human soul remains forever hidden within those gaps in the informational network that cannot be rationally filled. Yet such 'unknowability' does not devalue the literary heritage; on the contrary, it frees the text from the tyranny of a single 'correct' interpretation. In a world where any fact may be endlessly replicated, authorship is transformed from an object of study into a process of continuous intuition. In this way, *Flaubert's Parrot* becomes a pertinent reflection on our ability to perceive the world beyond its informational surrogates, suggesting that it is precisely the impossibility of grasping the 'original' that grants the reader the right to become the true demiurge of final meaning.

BARRIERS TO GENDER EQUALITY IN EDUCATION: CAUSES AND SOLUTIONS

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Gender equality in education is considered one of the basic principles of modern society, as it supports social justice and sustainable development. However, even though access to education has improved significantly in many countries, true equality is still not fully achieved. It is important to understand that equality in education is not only about being able to attend school or university. It also includes equal participation in learning, fair treatment from teachers, equal access to different subjects, and equal career opportunities after graduation.

Socio-cultural barriers. One of the main barriers to gender equality in education is related to social and cultural norms. From early childhood, children are influenced by expectations about how boys and girls should behave and what roles they should take in society. Gender stereotypes are one of the key problems.

Boys are often associated with technical thinking, mathematics, and leadership, while girls are linked to communication and caring roles. These stereotypes influence students' confidence and subject choices. As a result, girls may avoid STEM subjects, while boys may avoid humanities, even if they have an interest in them. Family and community expectations also play an important role. In some cases, especially in traditional or rural areas, girls are expected to focus on household responsibilities or early marriage instead of education. Boys, on the other hand, may be encouraged to leave school early to work and support the family.

Institutional barriers. Educational institutions can also unintentionally reinforce gender inequality. One example is the curriculum, where male figures are often more represented than female ones. This can affect how students see their own potential in different fields. Teacher behaviour is another important factor. Even without realising it, teachers may encourage boys more in STEM subjects and girls more in language-related subjects. These small differences can influence confidence and academic development over time. The school environment can also create barriers. In some cases, girls face safety issues or lack proper facilities, which affects attendance. Boys, on the other hand, may face pressure not to show emotions or ask for help, which also limits their development.

Economic barriers. Economic factors are another important reason for gender inequality in education. In low-income families, education decisions are often based on financial limitations. Boys are sometimes prioritised because they are seen as future providers for the family, while girls are expected to do unpaid household work. Costs related to education, such as transport, uniforms, and materials, can also become a serious barrier. In addition, long distances to schools and safety concerns often affect girls more strongly, reducing their access to education.

Psychological barriers. Psychological factors also play a role. Students often internalise stereotypes, which affects their self-confidence and academic choices. Girls may feel less confident in mathematics and science, while boys may feel uncomfortable in subjects like literature or the arts. Another important issue is stereotype threat, where awareness of negative stereotypes can actually reduce performance. The lack of role models is also significant. If students do not see people of their gender succeeding in certain fields, they may not consider those careers as realistic options.

Gender inequality in education leads to long-term negative consequences. It reduces individual opportunities and limits social and economic development. When people cannot fully develop their potential, society loses talent and innovation. It can also strengthen poverty cycles and increase social inequality. In

addition, it reduces diversity in professional and decision-making fields, which is important for balanced development.

Solutions:

(1) Solving gender inequality requires action on several levels.
(2) At the policy level, governments should ensure equal access to education and protect students from discrimination. Scholarships and financial support can also help reduce inequality.
(3) Curriculum reform is also important. Educational materials should include balanced representation of both genders and highlight contributions of women and men equally.
(4) Teachers should receive training to recognise bias and create inclusive classrooms where all students are encouraged equally.
(5) Schools must also ensure safe environments, prevent harassment, and provide proper infrastructure for all students.
(6) Changing social attitudes is essential.

Gender inequality in education is a complex issue caused by social, institutional, economic, and psychological factors. Although access to education has improved, equal opportunities are still not fully achieved. From a student's perspective, it is clear that real progress requires not only laws and policies but also changes in everyday attitudes. Education should allow every student, regardless of gender, to develop freely and reach their potential. Achieving gender equality in education is important not only for fairness but also for the development of a more inclusive and successful society.

LINGUISTIC AND STYLISTIC STRATEGIES FOR RENDERING LACONIC PROSE IN UKRAINIAN TRANSLATION (BASED ON *THE BEAR* BY ANDREW KRIVAK)

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Laconic prose, characterised by brevity, semantic richness, and emotional restraint, has consistently posed a distinctive challenge for translators. In Andrew Krivak's novel *The Bear*, minimalism functions not merely as a stylistic device but as the foundational principle of the narrative structure, shaping the text's atmosphere, imagery, and philosophical depth and translating such a work into Ukrainian demands carefully considered linguistic and stylistic strategies that preserve the original's aesthetic and cognitive impact.

Syntactic compression. Krivak's original favours short, simple sentences with a minimal use of subordinate clauses. Ukrainian, by contrast, often tolerates

or even prefers more elaborate syntactic structures. However, the translator must resist the temptation to expand sentences unnecessarily. Preserving concise, clear syntactic units recreates the rhythm, fragmentation, and meditative quality of the author's style. This may involve splitting complex Ukrainian constructions or using paratactic rather than hypotactic connections.

Lexical precision and restraint. The language of *The Bear* demonstrates high semantic density: each word carries substantial weight. In translation, equivalents should be chosen not only for denotative accuracy but also for their ability to evoke multiple meanings without explicit emotional or evaluative overtones. Avoiding overly charged or stylistically marked vocabulary helps maintain the original's neutral, contemplative register. Where Ukrainian offers synonyms with differing degrees of expressiveness, the least marked option is often preferable.

Ellipticality and implicitness. Much of the novel's meaning is conveyed indirectly through omissions, pauses, and what remains unsaid. This narrative strategy invites readers to co-create the text's significance. In translation, it is crucial not to fill these gaps with explanatory additions or logical connectors that are absent from the source. Preserving ellipsis and implicitness respects the author's concept and retains the work's openness to interpretation. Occasional compensation may be used elsewhere in the text, but only if it does not disrupt the overall laconic tone.

Rhythmic and phonetic features. The laconic style of *The Bear* is closely tied to descriptions of nature, creating an atmosphere of silence, space, and temporal suspension. In Ukrainian, these qualities can be conveyed through a carefully managed phrase rhythm (e.g., alternating short and medium-length units), euphony (avoidance of dissonant consonant clusters), and the deliberate use of pauses. The translator should also consider the musicality of vowels and the flow of unstressed syllables, as these contribute to the meditative reading experience.

Stylistic neutrality and universality. Because the novel's events unfold in a non-civilisational, almost timeless natural setting, the translation should avoid culturally marked elements—specific nationalisms, historical allusions, or local idioms that could narrow the scope of interpretation. A neutral, almost archetypal lexicon allows Ukrainian readers to engage with the text's universal themes of survival, memory, and coexistence with nature.

Additional strategies for expansion. Beyond the points above, the translator may employ:

- *Compensation*: reintroducing a lost stylistic feature (e.g., parataxis) elsewhere in the text without adding new content.

• *Grammatical modulation*: adjusting verb aspects or tenses to reflect the original's timelessness; Ukrainian imperfective verbs often better convey durative, cyclical actions.

• *Punctuation as a stylistic tool*: using dashes or ellipses to mirror the original's fragmented syntax and pauses, while respecting Ukrainian punctuation norms.

The Bear, like other exemplars of laconic prose, demands from the translator a high degree of linguistic sensitivity, restraint, and strategic decision-making. By prioritising syntactic compression, lexical precision, ellipsis, rhythmic euphony, and stylistic neutrality, the Ukrainian translation can allow readers to experience the full depth of Krivak's minimalist vision. Further research might explore comparative analyses with translations of other laconic authors (e.g., Hemingway, Cormac McCarthy) into Ukrainian, as well as reader-response studies to test the effectiveness of the proposed strategies.

DECENTRALISED ENERGY SUPPLY FOR DESTROYED SETTLEMENTS BASED ON THE PROCESSING OF BIOMASS AND WASTE

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In the context of rebuilding destroyed settlements, it is advisable to transit to decentralised energy supply systems focused on the use of biomass and waste. This approach ensures the autonomy of social infrastructure facilities and reduces dependence on centralized energy grids, particularly in remote communities [1].

The most effective solution is a modular system involving biomass gasification and cogeneration. The use of agricultural waste (straw, husks, wood residues), as well as municipal waste, enables the creation of local energy sources capable of meeting the needs of individual buildings or groups of buildings. Modern cogeneration units based on micro-gas turbines with external heat supply are of particular interest. A distinctive feature of such units is the use of an external boiler with a high-temperature heat exchanger, which transfers energy to the turbine's working air, heating it to temperature of around 650–800 °C. In this case, the fuel combustion process takes place separately from the turbine's working circuit, allowing for the use of a wide range of biomass and waste types. The turbine operates on an open Brayton cycle at high rotational speed (up to 70,000 rpm). The separation of combustion products and working air flows ensures operational stability and reduces gas cleaning requirements. Such units are characterised by relatively low operating costs and service intervals of up to 6,000 hours, making them suitable for autonomous energy systems [2–4].

System operation flowchart: biomass → drying and grinding → combustion in an external boiler → high-temperature heat exchange → heating of working air → micro-gas turbine → electricity + heat → microgrid.

According to recent studies, plants of this type can have an electrical capacity in the range of approximately 30–200 kW, with the thermal capacity typically 1.5–2.5 times higher than the electrical output, and the overall system efficiency reaching 70–80% [3, 5]. It allows them to be adapted to various application conditions: low-capacity units (30–80 kW) are suitable for supplying energy to groups of private residential buildings or small facilities, while medium-capacity units (100–200 kW) can effectively provide heat and electricity to social infrastructure facilities, such as schools, hospitals, or administrative buildings.

This approach is particularly suitable for reconstructing destroyed settlements, as it simultaneously addresses two issues: the utilization of local waste and the energy shortage. Electricity is used to power building services (ventilation systems, pumps, lighting) and can also be fed into a local microgrid. Thermal energy is used for heating, domestic hot water supply, and preheating ventilation air, in line with the principles of energy-efficient design. Locating the generation source in the immediate vicinity of consumers ensures that thermal energy is transported with minimal losses.

An important element of the system is the integration of thermal energy storage. The use of buffer tanks allows excess heat to be stored and utilised during peak load periods, significantly increasing the overall system efficiency [6].

Thus, the proposed decentralised energy supply scheme is a viable engineering solution for the reconstruction of settlements, enabling the combination of waste utilisation and energy production. The availability of feedstock and the efficient use of heat determine the practical feasibility of bioenergy solutions.

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HYPERTEXTUAL ECHOES OF SHAKESPEARE IN CONTEMPORARY NOVELS

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The literary heritage of William Shakespeare continues to exert a profound influence on contemporary fiction. One of the most productive ways this influence manifests itself is through hypertextuality - a concept introduced by Gérard Genette, which describes the relationship between a later text and an earlier one that it transforms, parodies, or reinterprets. In modern novels, Shakespeare's plays frequently serve as hypotexts, providing structural, thematic, and character foundations that allow authors to explore contemporary social, political, and psychological issues.

A prominent form of such interaction is the direct transposition of Shakespearean plots into modern settings. By relocating the action to the worlds of politics, business, academia, or dysfunctional families, writers highlight the timelessness of Shakespeare's concerns with power, ambition, betrayal, revenge, and identity. These adaptations rarely remain faithful copies; instead, they reshape the original meanings to address present-day realities.

Another key aspect is the reworking of Shakespearean characters as updated archetypes. Modern protagonists often echo *Hamlet's* existential doubt and paralysis of will, or *Lady Macbeth's* ruthless ambition coupled with psychological disintegration. Contemporary authors, however, tend to enrich these figures with deeper psychological insight and adjust them to current cultural contexts, particularly in matters of gender, agency, and mental health.

Stylistic and linguistic allusions further strengthen the hypertextual link. Although contemporary prose seldom mimics Elizabethan blank verse, it frequently incorporates subtle quotations, motifs, or symbolic echoes. Such references function as intertextual signals, inviting readers to recognise the dialogue between the new work and the Shakespearean canon, thereby adding layers of meaning and cultural resonance.

Crucially, many contemporary engagements with Shakespeare go beyond imitation or homage. A significant number of authors adopt a critical stance, questioning the ideological underpinnings of the original plays – especially regarding gender inequality, social hierarchy, colonial attitudes, and structures of power. Through such reinterpretations, writers challenge the canon and propose alternative perspectives more aligned with twenty-first-century sensibilities.

Notable examples of these hypertextual echoes include:

- Ian McEwan's *Nutshell* (2016) – a compact, witty retelling of *Hamlet* narrated from the perspective of a foetus, which cleverly transposes the themes of betrayal, murder, and revenge into a modern London setting.
- Margaret Atwood's *Hag-Seed* (2016) – part of the Hogarth Shakespeare series, this novel reimagines *The Tempest* through a theatre production in a prison, blending Shakespearean magic with contemporary issues of incarceration, redemption, and artistic creation.
- Jeanette Winterson's *The Gap of Time* (2015) – a reworking of *The Winter's Tale*, which explores themes of jealousy, forgiveness, and the destructive power of time in a modern context involving finance, adoption, and social media.
- Tracy Chevalier's *New Boy* (2017) – a retelling of *Othello* set in a 1970s American school playground, highlighting racial tensions and adolescent cruelty.
- Jo Nesbø's *Macbeth* (2018) – a dark, violent transposition of *Macbeth* into a corrupt, drug-ridden 1970s Scottish city, where ambition and power struggles unfold against a backdrop of police corruption and political intrigue.

The hypertextual echoes of Shakespeare in contemporary novels testify to the remarkable vitality and adaptability of his dramatic legacy. Through plot adaptation, character transformation, stylistic allusions, and critical reinterpretation, today's writers sustain a living dialogue with the Shakespearean canon, proving that his works remain not only relevant but also endlessly generative for new literary creation.

SEMANTICS OF PARENTAL PROTECTION AS A SURVIVAL STRATEGY IN KRISTIN HANNAH'S *THE FOUR WINDS*

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In *The Four Winds,* the semantics of parental protection is lexicalised through a network of verbs denoting physical shielding (*to shelter, to cover, to stand before, to block, to wrap*) and nominal metaphors of refuge (*a wall, a shield, a fortress, a cocoon*), which collectively portray the mother's body as the primary locus of survival. This lexical configuration is most evident in scenes where the protagonist, Elsa Martinelli, positions herself between her children and external threats

whether the suffocating dust storms, the violence of strike-breakers, or the sheer exposure of homelessness. Verbs of interposition (*to stand in front of, to place oneself between, to cover with one's body*) recur with striking regularity, transforming maternal presence into a material barrier. Simultaneously, the nominal metaphors draw from the semantic domains of architecture and fortification: *Elsa's arms become a shelter, her resolve a wall, her body a fortress against a hostile world*. This metaphorical fusion of the corporeal and the architectural elevates parental protection from a mere emotional impulse to a structural principle of survival. Linguistically, the effect is reinforced by the use of possessive constructions (*her children were her only shield, she wrapped them in herself*) that blur the boundary between protector and protected. In Ukrainian translations, this dense metaphorical network often requires compensatory strategies: the compact English nominal metaphors tend to be rendered either with explicit similes (*як стіна, немов фортеця*) or with verb-based paraphrases that shift focus from the static image of protection to the active process of defending. Such shifts, while preserving the core meaning, subtly alter the symbolic weight of the mother's body as the ultimate refuge, occasionally diminishing the visceral, embodied quality of the original.

The semantic field of parental protection in *The Four Winds* is structured around the binary opposition of *presence vs. absence*: the mother's proximity correlates with safety, while her absence, even momentary, is encoded through lexis of exposure, vulnerability, and imminent threat. This opposition operates as a key narrative device that governs both plot development and lexical selection. In scenes where Elsa is physically near her children, the text accumulates nouns and adjectives denoting security: *warmth, shelter, calm, safe*. Her presence is often described through verbs of enclosure (*to gather, to hold, to tuck in*) that create a protective cocoon. Conversely, any separation triggers a marked shift in diction: the children are described as *exposed, naked, fragile*, while the environment is rendered through lexis of hostility (*wind biting, dust choking, shadows lurking*). Even momentary absences, Elsa stepping outside to check the sky, turning her back to prepare a meal, are linguistically amplified into scenes of heightened risk, with adverbs of immediacy (*suddenly, at once, in an instant*) and verbs of potential harm (*could snatch, might swallow, threatened to tear*) dominating the narrative voice. This binary is not merely thematic but syntactically embedded: passages of presence tend to employ static, durative verb forms and expansive descriptive clauses, whereas passages of absence favour short, paratactic structures that mirror the fragmentation of security. The opposition also extends to the representation of space: the domestic interior, when inhabited by the mother, is lexicalised as a *refuge*, but the same space, when she is absent, becomes a *cage of dust* or *an empty shell*. In the Ukrainian translations, this lexical polarisation is largely

preserved, though with interesting divergences: one translator consistently renders *exposure* with concrete nouns (*беззахисність*, *незахищеність*) that foreground physical vulnerability, while the other employs more abstract equivalents (*вразливість*, *ризик*), shifting the emphasis from embodied danger to situational precariousness. Both versions, however, retain the underlying semantic opposition, underscoring its centrality to the novel's construction of maternal protection as the fragile boundary between survival and catastrophe. Parental protection as a survival strategy is linguistically realised through deontic modality (*must, have to, need to*) in the mother's internal monologue, reflecting the transformation of maternal instinct into a rigid imperative for action.

The novel's representation of parental protection shifts lexically across the narrative: early chapters emphasise concrete, physical safeguarding (*feeding, clothing, sheltering*), whereas later sections foreground semantic domains of psychological fortitude (*hope, belief, teaching resilience*), indicating the evolution of survival strategy from immediate to long-term. In the initial sections set on the Martinelli farm in Texas, the lexicon of protection clusters around verbs of basic provision: *to feed, to clothe, to warm, to shelter, to hide*. These are frequently accompanied by nouns denoting material resources (*bread, water, a roof, a blanket*) and adjectives of scarcity (*bare, meagre, enough*).

The semantics of parental protection in *The Four Winds* intersects with the novel's broader lexical field of survival through recurrent collocations such as *fight for*, *hold on to*, and *keep safe*, creating cohesive ties that bind maternal devotion to the overarching theme of endurance. These multi-word units function as semantic bridges, linking the domain of maternal care, traditionally associated with nurturing and shelter, to the more aggressive, combative lexicon of survival. The collocation *fight for* appears consistently throughout the novel in contexts where Elsa's protective instincts converge with the struggle for existence: she fights for her children's food, for their place in the camp, for their right to be treated as human beings. The prepositional structure *for* introduces objects that shift from concrete (*food, water, a tent*) to abstract (*dignity, a future, a voice*), mirroring the narrative's expansion of what survival entails. Similarly, *hold on to* operates at the intersection of physical and emotional protection.

A contrastive analysis of the Ukrainian translation demonstrates divergent interpretations of parental protection, emphasises the collectivist dimension (protecting the family unit) and the individualised, psychological burden of maternal responsibility.

SPECIFICS OF THE FUNCTIONING OF THE THEATRICAL INTERVIEW IN THE UKRAINIAN CULTURAL SPACE

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The profound transformations in the social and cultural life of Ukraine during the late twentieth and early twenty-first centuries have precipitated substantial shifts in cultural and linguistic processes, conditioned by internal drivers of sociocultural development and by changes in communication – both linguistic and extralinguistic. The mass media constitute a highly influential social institution that responds swiftly to changes in public opinion, societal dynamics, and the artistic tastes of its audience. It is therefore pertinent to examine theatrical mass media and the generic diversity of contemporary journalism, insofar as these represent principal agents of linguistic and cultural change through which audiences receive, assimilate, and apply new information.

The theatrical interview may be regarded as a method of information acquisition. Journalism studies have identified several primary genre models according to purpose. The informational theatrical interview is a sub-genre whose objective is the collection of material for news coverage of artistic and cultural topics and the dissemination of information about new developments in theatrical life. A defining condition for its success is the timeliness of publication. When covering a new theatrical premiere, participants are interviewed several days in advance and materials published accordingly, establishing details pertaining to time, venue, marketing strategies, pricing policy, and the distinctive characteristics of the event.

This type of interview operates according to a defined set of topics – opening and closing exchanges alongside core interrogative prompts: who? what? where? when? why? This framework proves sufficient for factual data collection. Nevertheless, commentary on touring production statistics, for instance, must be contextually integrated into the narrative. Statements from theatre critics and domain specialists may also be incorporated to supplement the information provided.

Theatre media may additionally employ the flash survey, or on-site interview – commonly known as "street talk" or "vox pop." This genre model is characterised by the collection and presentation of diverse opinions on a specific subject, typically audience impressions of a premiere, touring production, or individual performance. Its procedure involves formulating uniform brief questions – or even a single question – put to the largest possible number of respondents connected to the theatrical event under coverage.

A further format widely employed in theatrical journalism is the portrait interview, or personal interview, distinguished by its focus on a single individual. Such interviews require thorough preparatory research: reviewing published materials about the prospective interviewee, consulting those who know the subject well, and engaging external observers and experts. The subject is typically a prominent figure in the theatrical and artistic life of the country. Portrait interviews may also be conducted with "stage workers" – essential participants in the theatrical process who hold original perspectives on creative work; such interviews may incorporate elements of memoir writing. Considerable attention is paid to detail – set design, costumes, the interviewee's speech patterns and appearance – all of which construct a portrait of individuality capable of engaging the audience.

A comparatively recent genre model in Ukrainian journalism is the creative interview. Here the journalist becomes a fully-fledged participant in dialogue, functioning as a communicative mediator. This model is oriented toward Socratic eristics, in which dialogue serves as a means of arriving at shared conclusions and discerning the essence of the realities under discussion. Such creative interaction aims not merely at informational output, but encompasses elements of literary-publicistic genres – the literary sketch, the essay, and fragments of documentary broadcasts or films.

The success of this format depends critically on the journalist's professional standing: extensive experience, creative reputation, and the judicious selection of an interlocutor whose abilities or social position enables deeper generalisation – discerning the dramatic dimension within a problem and universal human significance within an individual life.

Contemporary Ukrainian theatre journalism productively employs informational and analytical interview genres in numerous modifications. It may therefore be concluded that modern Ukrainian journalism features a developed system of genre models within which the theatrical interview, in all its forms, is actively produced – attesting to a process of hybridisation that evidences the synergistic dimension of the culturological press of contemporary Ukraine.

IMPORTANT ROLE OF GAS ANALYZERS IN LIVESTOCK FARMS

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Modern livestock farming is characterized by a high level of intensification, which requires precise control of the microclimate. One of the critical factors determining the health and productivity of livestock is the gas composition of the

air [1,2,3]. In this context gas analyzers are the devices for monitoring the concentration of harmful and explosive substances. Gas analyzers become a fundamental component of farm automation systems.

In the process of animal metabolism and the degradation of organic waste, the following substances are accumulated in the air [2,4]:

Ammonia (NH_3) irritates the mucous membranes, causes the pulmonary edema and reduces the resistance to infections;

Hydrogen sulfide (H_2S) is a potent neurotoxin that disrupts tissue respiration;

Carbon dioxide (CO_2) is present in high concentrations and this leads to acidosis and lethargy;

Methane (CH_4), in addition to its negative impact on respiration, poses an explosion risk when concentrations exceed 5%.

Timely recording of the increase of MPCs (maximum permissible concentrations) helps to prevent mortality and reduced productivity (milk yield, weight gain).

Modern gas monitoring systems use two main types of sensors:

Electrochemical sensors are ideal for detecting ammonia and hydrogen sulfide, they are highly accurate at low concentrations;

Optical (infrared) sensors are used to monitor methane and carbon dioxide. They are resistant to harsh environments (high humidity and dust), which are typical for livestock facilities.

To ensure data reliability, sensors are placed taking into account the molar mass of the gases:

Light gases (CH_4, NH_3) are in the upper zone of the room or directly above the animals;

Heavy gases (H_2S, CO_2) are in the lower zone (at floor level), where the concentration of these toxins is the highest.

It is important to protect the sensors from direct exposure to moisture and dust using filters, as well as to avoid areas with strong drafts, which can artificially lower the readings.

Integrating gas analyzers into climate control systems allows ventilation to be automatically activated in the event of a hazard. This minimizes the impact of the “human factor,” improves energy efficiency through the rational operation of fan motors and ensures personnel safety by protecting people from the toxic effects of gases. Emissions monitoring enables enterprises to comply with modern environmental standards by reducing greenhouse gas emissions of methane and ammonia into the atmosphere, which is the requirement for the sustainable development of agricultural sector.

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FORMATION OF THE NETWORK OF EXTRA-CURRICULAR EDUCATION INSTITUTIONS USING THE EXAMPLE OF THE CITY CASABLANCA

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Problem statement. The modern transformation of the education system requires the search for new models of organizing youth leisure and development. The city of Casablanca (Morocco) is an interesting object for research, as it demonstrates successful experience in developing a network of extra-curricular institutions in the complex socio-economic conditions of a metropolis. This experience allows the identification of effective mechanisms of interaction between the state, the community and international funds in the field of extra-curricular education [1].

Research purpose. is to analyze the structural features and principles of forming the network of extra-curricular education institutions in Casablanca to determine the possibilities of adapting foreign experience into Ukrainian educational practice.

Research results Casablanca, as the economic center of Morocco, faces the challenges of high population density and social inequality. The formation of the extra-curricular education network here is based on the principle of territorial inclusivity and multi-functionality of the centers. The main links of the network are the state youth houses (Maisons de Jeunes) and the specialized cultural centers.

An important feature of the network is its focus on the "problematic" areas. For example, the experience of creating cultural centers in the Sidi Moumen district (in particular, the activities of the Ali Zaoua Foundation) shows how the extra-curricular education becomes a tool for social rehabilitation. The network of institutions in the city is formed in three priority areas:

1. Artistic and cultural direction (development of creative industries, theater, music);
2. Technological direction (centers for digital literacy and media education);
3. Socio-pedagogical direction (prevention of radicalism and unemployment among youth) [3].

Morocco's state policy is aimed at decentralizing the management of these institutions, which allows each district of Casablanca (prefecture) to adapt the

education program to the specific needs of the local community. The use of public-private partnerships allows for the attraction of investments for the technical equipment of centers, making extra-curricular education competitive and attractive for teenagers [2].

Table 1

Classification of extra-curricular education institutions in Casablanca

Type of institution	Main field of activity	Target audience
Maisons de Jeunes	Socialization, sports, basic clubs	Children and youth (7–25 years)
Ali Zaoua Foundation	Art therapy, theater, choreography	Youth from at-risk groups
Ecoles de Technologie	Robotics, programming, IT	Adolescents (12–18 years)
Socio-Cultural Centers	Language courses, exam preparation	University students

Conclusions. The analysis of the extra-curricular education network in Casablanca leads to the conclusion that its effectiveness is due to the combination of social protection with the development of creative potential of youth. Key success factors are the territorial accessibility of institutions, their integration into the city's cultural landscape and the active involvement of private investment through public-private partnership mechanisms.

For Ukraine, the experience of creating multi-profile youth centers that combine educational, digital and cultural services within one space is useful. In particular, the adoption of the Moroccan model of "cultural revitalization" of depressed areas, where an extra-curricular institution becomes not only an educational platform but also a center of social cohesion for the community, is seen as appropriate. The implementation of similar approaches in the Ukrainian practice will contribute to the creation of flexible system of extra-curricular education capable of responding promptly to the current needs of youth in the context of digitalization and modern social challenges.

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INNOVATIVE MATERIALS AND TECHNOLOGIES IN SUSTAINABLE CONSTRUCTION: CHALLENGES FOR THE THIRD MILLENNIUM

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The construction industry is currently undergoing a fundamental transformation driven by the necessity of sustainable development and environmental responsibility. As we move further into the third millennium, the role of a civil engineer is no longer limited to ensuring structural stability and cost-effectiveness. Today, the integration of ecological safety, resource efficiency, and innovative material science has become a primary objective. This paper explores the transition towards sustainable construction practices, focusing on "green" materials and their potential application in the modern engineering landscape.

One of the most significant challenges in civil engineering is the carbon footprint associated with traditional concrete production. Portland cement, the primary binder used globally, is responsible for approximately 8% of global carbon dioxide emissions. To mitigate this impact, the development of "green concrete" has emerged as a vital research area. Green concrete refers to a type of concrete that incorporates waste materials or industrial by-products, thereby reducing the consumption of natural resources and energy.

Key innovations in this field include the partial replacement of cement with supplementary cementitious materials such as fly ash, ground granulated blast-furnace slag, and silica fume. These materials not only reduce the environmental burden but often enhance the durability and chemical resistance of the structures. Furthermore, the use of recycled aggregates-obtained from the crushing of demolished concrete structures-is gaining momentum. This approach promotes a circular economy in construction, which is particularly relevant for countries facing the need for large-scale infrastructure restoration.

In addition to material innovation, the precision of structural design has reached new levels due to digitalization. The application of Building Information Modeling (BIM) allows engineers to calculate material requirements with high accuracy, minimizing waste during the construction phase. For a first-year engineering student, understanding the synergy between material properties and digital modeling is essential. The ability to predict how a specific concrete mix will behave under different load conditions-compression, tension, or bending-using advanced software is a core competency for the "Engineer of the III Millennium."

The Ukrainian context adds a unique dimension to these global trends. The post-war reconstruction of Ukraine's infrastructure will require massive amounts of building materials. Implementing sustainable technologies, such as utilizing

construction debris for new foundations or road bases, can significantly accelerate the recovery process while adhering to European environmental standards. This task requires a new generation of engineers who are capable of combining classical structural mechanics with innovative ecological approaches.

Another promising direction is the development of self-healing concrete. By embedding microcapsules containing healing agents or specific bacteria into the concrete matrix, structures can autonomously repair cracks. This technology significantly extends the service life of bridges, tunnels, and high-rise buildings, reducing maintenance costs and ensuring long-term safety. While still in the refinement stage, such technologies represent the future of architectural engineering.

In conclusion, the evolution of construction and architecture in the 21st century is defined by the balance between technological progress and environmental preservation. The transition to sustainable materials, the adoption of circular economy principles, and the use of digital design tools are no longer optional; they are mandatory for future engineers. As we prepare to rebuild and modernize our cities, the focus must remain on creating resilient, efficient, and eco-friendly structures that will serve society for generations to come.

RENEWABLE ENERGY TECHNOLOGIES IN THE THIRD MILLENNIUM

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The rapid development of energy technologies in the twenty-first century has created new opportunities for sustainable growth [1]. Renewable energy sources such as solar, wind, hydro and biomass are increasingly replacing fossil fuels, reducing greenhouse gas emissions and improving energy security [2].

The twenty-first century has become a turning point in the development of energy technologies [1]. Humanity faces the dual challenge of meeting growing energy demand while reducing environmental impact. Engineers are at the forefront of this transformation and designing systems, that combine efficiency, sustainability and resilience.

1. Solar Energy. Solar photovoltaic (PV) technology has advanced rapidly in recent decades [3]. Modern panels achieve efficiencies above 25%, while new materials, such as perovskites, promise even higher performance [4]. Large-scale solar farms are being integrated into national grids and decentralized rooftop systems empower households to become energy producers. The challenge remains in storage and grid stability, but innovations in battery technology are addressing these issues.

2. Wind Power. Wind energy has become one of the most cost-effective renewable sources [5]. Offshore wind farms with turbines exceeding 12 MW capacity are transforming coastal regions into hubs of clean energy [6]. Engineers are developing floating platforms that allow turbines to be installed in deep waters, expanding the potential of wind power. The integration of wind energy requires advanced forecasting and smart grid management to balance supply and demand.

3. Hydropower and Small-Scale Solutions. Traditional hydropower remains a reliable source of electricity, but ecological concerns have shifted focus toward small-scale hydro systems. Micro-hydro plants can provide energy to remote communities without significant environmental disruption. Engineers are also exploring hybrid systems that combine hydro with solar or wind to ensure continuous supply [7].

4. Biomass and Bioenergy. Biomass energy utilizes organic waste, agricultural residues and forestry by-products. Modern bioenergy plants convert these materials into electricity heat, or biofuels. The challenge lies in ensuring sustainability and biomass must not compete with food production or lead to deforestation. Engineers are working on efficient conversion technologies, such as anaerobic digestion and advanced gasification [8].

5. Hydrogen Economy. Hydrogen is increasingly seen as a key energy carrier of the future. Produced through electrolysis using renewable electricity, hydrogen can store energy and serve as fuel for transportation, industry and heating. Engineers are developing safe storage methods, efficient fuel cells and infrastructure for hydrogen distribution. The hydrogen economy could complement renewables by providing long-term storage and decarbonizing sectors that are difficult to electrify [9].

6. Smart Grids and Digitalization. The integration of diverse renewable sources requires intelligent energy management. Smart grids use sensors, data analytics and automation to balance supply and demand in real time. Digitalization enables predictive maintenance, demand response and decentralized energy trading. Engineers must ensure cybersecurity and reliability while designing these complex systems [10].

7. Challenges and Perspectives. Several challenges are remained despite the progress. Energy storage technologies must become more efficient and affordable [1]. Grid infrastructure requires modernization to handle variable renewable inputs. Policy frameworks and international cooperation are essential to accelerate adoption [2]. Engineers play a crucial role in addressing these issues by combining technical expertise with innovative thinking.

Conclusion. Energy technologies of the third millennium are reshaping the way humanity produces and consumes power [1]. Solar, wind, hydro, biomass and

hydrogen offer pathways to a sustainable future. Engineers are not only solving technical problems, but also shaping the vision of a cleaner, more resilient world. The responsibility of the new generation of engineers is to ensure that energy systems meet the needs of society while preserving the planet for future generations [2].

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HEAT PUMPS AS AN EFFICIENT AND ENVIRONMENTALLY FRIENDLY ALTERNATIVE TO TRADITIONAL HEAT SOURCES

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In the context of global climate change, rising energy costs and energy instability one of the most promising solutions is the use of heat pumps. This equipment provides heating, cooling and hot water by utilizing renewable energy from the environment with minimal environmental impact. Their efficiency, environmental friendliness and durability make heat pumps one of the key technologies in modern energy [1].

A heat pump is a device that transfers heat from the surrounding environment to a building's heating system. Its operating principle is based on the physical laws of thermodynamics: even at low ambient temperatures, a certain amount of heat is retained, it can be "extracted" and utilized. The heat source can be air, soil or water. As the refrigerant circulates through the system, it absorbs heat from the environment; the compressor then raises its temperature and the condenser transfers the accumulated heat to the heating system.

The typical coefficient of performance (COP) for modern heat pumps ranges from 3 to 5. This means that for every 1 kW of electricity consumed the device produces 3–5 kW of thermal energy. Such efficiency significantly exceeds the capabilities of traditional electric heaters or fossil fuel boilers [2].

There are several main types of heat pumps:

Air-to-air. These units extract heat from the outside air and transfer it to the indoor space. This is the most common and least expensive type, often used in residential air conditioners with a heating function;

Air-to-water. Heat water for the heating system or hot water supply. They provide comfort even at outdoor temperatures as low as 25 °C thanks to inverter compressors;

Ground-water. Utilize the stable temperature of the ground. Although their installation is more complex and expensive, they are the most efficient and stable;

Water-water. Extract heat from natural or artificial bodies of water. This type offers high efficiency, but requires a water source near the building.

Heat pumps are an effective way to save energy. They can reduce heating costs by 50–70% compared to traditional systems. Additionally, users become less dependent on fluctuations in energy prices [3].

From an environmental standpoint, heat pumps reduce carbon dioxide emissions. Since they use renewable energy from the environment, the amount of greenhouse gases released into the atmosphere is significantly lower. For Ukraine, which seeks to reduce its dependence on imported energy resources and develop renewable energy, this technology is of strategic importance.

The efficiency of heat pump depends not only on its type, but also on the quality of the system design. It is important for the building to be well insulated, as heat pumps operate most efficiently at low heat transfer fluid temperatures around 35–45 °C, which are typical for underfloor heating systems or radiators with a large heat exchange surface area.

Installing the system requires a professional approach: geological conditions (for ground-source heat pumps); the location of outdoor units (for air-source systems); proper hydraulic piping must be taken into account. Incorrect configuration can significantly reduce efficiency and shorten the equipment's service life [4].

Despite numerous advantages, heat pumps also have certain drawbacks. Among them is the high initial cost of equipment and installation, which can pay for itself within 5–10 years. Additionally, the efficiency of air-source models drops significantly at very low temperatures and installing ground-source systems requires extensive excavation work.

However, current market trends are encouraging. Technologies are constantly improving: models with higher COPs; more environmentally friendly refrigerants; smart control systems are emerging. In Europe and Ukraine the government is promoting their use through energy efficiency programs. In particular, as part of the "green transition," heat pumps are viewed as a key element in the decarbonization of the residential sector.

In short, heat pumps are not only an efficient heating and cooling technology, but also a key tool for achieving climate neutrality. They combine environmental sustainability, economic benefits, and technological innovation. The role of heath pumps in the future energy sector will only grow with rising energy prices and stricter environmental requirements. The widespread adoption of heat pumps in Ukraine could be a significant step toward energy independence and sustainable development.

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EXPRESSIVE MEANS AND TRANSLATION TRANSFORMATIONS IN THE REPRODUCTION OF LANDSCAPE DESCRIPTIONS (BASED ON *DANDELION WINE* BY RAY BRADBURY)

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Landscape in a literary text is an important component that performs not only a nominative function but also emotional, expressive, symbolic, and psychological functions. In Ray Bradbury's novel *Dandelion Wine*, landscape descriptions shape the atmosphere of summer as a metaphor for childhood, time, and memory. The relevance of this study is determined by the need to analyse the ways of reproducing such imagery in the Ukrainian translation.

The research aims to identify the peculiarities of expressive means and translation transformations used in rendering landscape descriptions. Landscape is considered a multi-layered element of the text that performs descriptive, emotional, and symbolic functions. For example, in the novel, the description of the morning town not only establishes the setting but also conveys a sense of anticipation: *"The town was silent as a fresh glass of milk"*. This image combines visual and tactile associations, creating an effect of purity and freshness.

The author's style is characterised by extended metaphors, synaesthesia, and the symbolism of summer. For example: *"Summer was a green perfume drifting through the air"*. This metaphor blends colour and smell, producing a complex sensory image. In English, imagery is often achieved through compact metaphor, whereas Ukrainian tends to expand the image. For example: Eng.: *green silence* –

Ukr.: *зелена тиша, напоєна шелестом листя.* Thus, translation often involves explicitation of the image.

According to the classification, the following transformations are distinguished: concretisation, generalisation, modulation, and syntactic restructuring. For example: *"a vast summer noon"* → *"широкий спекотний літній полудень"* (concretisation + addition)

Landscape is a complex stylistic category that requires a comprehensive translation approach, taking into account the function of the image in the text. In the novel, summer landscapes dominate, symbolising the fullness of life: *"The summer day burned slowly like a candle"*. Night landscapes create an atmosphere of mystery, while urban ones evoke nostalgia. The main expressive means include: epithets: *hot blue sky;* metaphors: *the sun melted the streets;* personification: *"The wind whispered secrets in the trees"* – *"Вітер шепотів таємниці в гіллі дерев."* The personification is preserved, though the syntax is modified.

Inversions and parallelism are also characteristic: *"Gone was the spring, come was the summer"* – *"Весна минула – настало літо"*. The inversion is transformed into a normative Ukrainian construction (grammatical transformation).

Landscape descriptions are characterised by a high concentration of tropes and complex syntactic organisation, which creates difficulties for translation. The Ukrainian translation aims to reproduce the poetic nature of the original but is forced to adapt structures according to the norms of the Ukrainian language. Example: *"The air tasted like apples"* – *"Повітря було на смак, мов яблука"*. Calquing with partial restructuring is applied: *"endless summer"* → *"безкінечне літо"* (direct equivalent). The original often contains long rhythmic periods: *"And the lawns were wide and the trees were tall and the sky was endless"* – *"І газони були широкі, і дерева високі, і небо безкрає"*. Parallelism is preserved, which is crucial for rhythm.

The adequacy of translation is determined by the following criteria:

- semantic accuracy
- stylistic correspondence
- functional equivalence

In most cases, the translation preserves imagery, although it is sometimes simplified. Translation of landscape descriptions is a compromise between accuracy and artistry and involves the active use of transformations.

Landscape descriptions in the novel *Dandelion Wine* are a key means of shaping the fictional world. Their translation into Ukrainian requires the use of various transformations to preserve imagery, rhythm and emotional impact. The most effective approach is a combination of lexical, grammatical and stylistic techniques.

HYBRID POWER SYSTEMS FOR BUILDINGS

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Hybrid power system is a very relevant topic nowadays not only in Ukraine, but also in Europe. The hybrid system "PV + heat pump" has the lowest energy cost (LCOE) compared to other systems [1]. According to data provided by Latvia, Spain and Germany, which tested these systems, they reduced CO_2 emissions by 40-60% compared to a gas boiler [2]. There was even a "GreenDIM" program in Ukraine, where the government reimbursed up to 70% of equipment costs through grants for condominiums and housing cooperatives, thus encouraging people to switch to autonomous energy systems [3].

What is a hybrid system and what does it consist of? Hybrid alternative energy systems come in different types. There are fully autonomous systems that do not consume electricity from the centralized grid and can even sell excess electricity back to the grid, which can generate profit. There are also hybrid-combined systems that focus on generating and using alternative energy, but when it is insufficient, the building starts drawing power from the centralized grid.

To compare a standard gas boiler with a hybrid system, let`s look at the table below, which shows the differences in more detail:

Table 1

Parameter	**Gas Boiler**	**Hybrid System**
CO_2 emissions	100%	-40...-60%
Monthly costs	high (gas price)	-30...-50%
Autonomy	zero (no gas → cold)	days/weeks (with batteries)
Service life	10-15 years	up to 40 years

These systems have almost the same sequence of components in the chain. It is necessary to have solar panels, solar inverter, heat pumps and batteries for creating a hybrid system. Solar panels generate electricity to run the heat pumps and supply power directly to the home. Heat pumps, in turn, provide space heating and supply hot water to the system. Batteries are needed at night, when solar panels cannot generate electricity. Our house does not lose heating, that is, batteries which charge throughout the day, will power the system. Besides, if the system is connected to the centralized grid, batteries can be additionally charged from it, or the building can use grid power during the periods of very low solar

activity, when the panels cannot generate the required amount of energy. With all these factors in mind, it is even recommended to connect heat pumps directly to batteries so that they can operate at reduced voltage in the circuit [4]. It gives the confidence that heat will always be at home and thanks to this system with batteries and inverters, it will be additionally protected from sudden voltage fluctuations or power outages.

Such systems have a payback period of about 7-9 years for small residential dwellings and up to five years for enterprises based on energy supply costs for businesses. More powerful combinations are needed in cases of increased energy demand for residential premises and they can extend the payback period to 15 years. The quality of the components themselves and their maintenance must not be forgotten. The payback period will be longer, up to 20 years, if to develop a large, fully autonomous hybrid system with premium components, but these systems are designed for up to 40 years of operation, provided that high-quality equipment inspections are carried out at least once a year. Batteries are the most expensive components as there are different needs and operating times for essential appliances.

Europe is currently trying to reduce carbon emissions into the environment. Therefore, hybrid systems are seen as a step towards achieving the full decarbonization. Sales of heat pumps and equipment for hybrid systems were increased by 38% for pursuing this goal in 2023 [5].

In conclusion it`s possible to say that hybrid power systems serve different purposes and they have only a positive impact both on the environment and on people's lives. These hybrid power systems reduce the carbon footprint in Europe and they give light, stability and save lives when such systems are used in hospitals or emergency centers in Ukraine. That is why the hybridization is considered to be an important topic for our society and a big step into the future.

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ROLE OF ENVIRONMENTAL DESIGNER IN SHAPING PUBLIC OPINION

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In modern society, environmental design plays an important role in shaping living conditions and influencing social processes. The space in which people live, work, and interact affects not only their physical comfort but also their emotional state, behavior, and communication. Therefore, the role of an environmental designer in shaping public opinion becomes increasingly relevant in the context of urban development and the transformation of public spaces.

The purpose of this writing is to analyze the role of environmental design in influencing social behavior and public perception, as well as to determine the responsibilities of designers in creating functional, safe, and socially oriented spaces.

Environmental design is the process of creating and organizing spaces where people live, work, and spend their leisure time. These spaces include public squares, parks, streets, transportation areas, public buildings, and interiors. One of the key characteristics of environmental design is its ability to influence human behavior and social interaction.

Well-designed open and illuminated spaces create a sense of safety and encourage communication between people, while poorly organized or uncomfortable environments can lead to stress and social isolation. Elements such as lighting, color, materials, and spatial planning significantly affect the perception of space and the emotional well-being of users.

One of the main tasks of an environmental designer is to create a comfortable, functional, and safe environment for all groups of the population. The principle of inclusivity is especially important, as it ensures accessibility for people of different ages and physical abilities. In modern conditions, particular attention should also be paid to safety requirements, including the possibility of quick evacuation and access to protective shelters in emergency situations.

In addition, contemporary designers must consider environmental sustainability and responsible resource management. The use of environmentally friendly materials and energy-efficient solutions contributes to the creation of sustainable urban environments and improves the overall quality of life.

Fig. 1. Superkilen Park, Copenhagen, Denmark – example of a public space that promotes social interaction

Fig. 2. Accessible pedestrian ramp – example of inclusive environmental design

Environmental design is a significant factor in shaping public opinion and social behavior. The work of an environmental designer goes beyond creating aesthetically pleasing spaces and includes responsibility for social interaction, safety, and the well-being of society. Thus, designers play a crucial role in forming the cultural and social environment of modern communities.

NEOLOGISMS IN MODERN ENGLISH: PECULIARITIES OF FORMATION AND FUNCTIONING

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Modern English is characterized by a high level of dynamic development caused by active social, cultural, economic, and technological changes in global society. One of the most significant manifestations of language evolution is the emergence of neologisms, which reflect new phenomena, processes, and concepts of contemporary life. Neologisms are an important component of the lexical system of language, as they ensure its ability to adapt to new communication conditions [1].

In modern linguistics, neologisms are defined as new words, new meanings of existing words, or new word combinations that appear during a certain stage of language development. The main reasons for the emergence of neologisms include scientific and technological progress, globalization, intercultural communication, the spread of digital technologies, social media, and mass communication. New words are especially actively formed in the fields of information technology, culture, politics, and youth communication [3].

Among the main ways of forming neologisms in modern English are affixation, compounding, abbreviation, shortening, semantic shifts, and borrowings. Word-formation processes are considered to be the most productive, as they allow the rapid creation of new lexical units according to social needs [4]. Borrowings from other languages also play a significant role due to globalization.

The functioning of neologisms is particularly noticeable in modern media and social networks, where new words spread rapidly among large audiences. Social media serve as an important mechanism for popularizing new lexical items, contributing to their quick adaptation and integration into everyday speech [5].

Thus, neologisms are an essential factor in the development of modern English, as they not only enrich its vocabulary but also reflect current social transformations. Their study is allowed for a deeper understanding of language development processes and the interaction between language and the modern sociocultural environment.

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ANALYZING THE ROBUSTNESS OF AI CONTENT DETECTORS TO IMAGE MODIFICATIONS

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The widespread proliferation of generative artificial intelligence (AI) technologies has led to the mass integration of these tools into daily life and the information space. In connection with digitalisation processes and the fight against disinformation, the development of reliable systems for recognising generated images has become a critically important task. However, existing detection algorithms often prove to be vulnerable to various transformations, significantly losing accuracy when analyzing compressed or modified media files [1].

The aim of this study is to analyze the robustness of popular generated content recognition systems to real-world information distribution conditions on the Internet, particularly, via messengers and social networks, where images inevitably undergo compression and lose original metadata [2].

To conduct the experiment, three publicly available and popular AI services were selected: TruthScan, QuillBot and Isgen.ai. All these platforms utilise computer vision and deep learning models for pixel-by-pixel scanning of media files. As noted by the authors, their algorithms are trained on extensive databases to recognise visual artifacts invisible to the eye, unnatural textures and lighting anomalies. Furthermore, they perform deep analysis of noise patterns, metadata, and specific compression traces, which are the characteristic features of generated content[3][4][5].

For the empirical study of the effectiveness of these tools, a control test sample, consisting of 5 real digital photographs and 5 images fully generated using modern neural networks (GPT Image 2 and Nano Banana 2) was formed. The study was conducted in two independent stages. At the first stage, all original media files were sequentially uploaded to the selected services. The goal of this step was to record the baseline recognition accuracy of AI detectors under ideal conditions without external interference in the file structure. At the second stage, a simulation of the impact of the real user environment was performed. In real-world scenarios, as research indicates, images inevitably undergo unforeseen digital transformations that disrupt pixel distribution and destroy the discriminative artifacts of generative models [6]. Considering this, all images from our sample were subjected to purposeful modifications. Specifically, proportional resizing, edge cropping, the application of basic filters, and uploading to Telegram were applied. Subsequently, the modified set of files was re-analyzed by the detectors to assess the degree of degradation of their accuracy and the ability to detect fakes after the loss of low-level mathematical patterns.

The results of the first testing stage demonstrated the absolute accuracy of the selected tools. All original photographs and AI-generated images were identified without error, confirming the high reliability of these services under ideal conditions.

However, the second testing stage revealed critical vulnerabilities of the algorithms to digital transformations. The analysis of real modified photographs kept the baseline indicator high. However, the Isgen.ai service produced one false positive, while TruthScan and QuillBot recorded an abnormal increase in the AI probability for content created by humans.

The analysis of modified AI content confirmed the thesis that algorithms are vulnerable to transformations. After resizing and applying various filters, the systems began to classify en masse the generated images as real. TruthScan and Isgen.ai recognised only 2 out of 5 generated files. The QuillBot service demonstrated the lowest resilience and failed to recognise a single image.

The study proves the vulnerability of modern AI detectors to standard image modifications. The high accuracy of algorithms under ideal conditions is negated when content is disseminated via real-world online channels. The results confirm the systems' tendency to misclassify altered files. To effectively counter disinformation, it is necessary to develop hybrid models that combine the analysis of pixel noise and visual semantics.

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BIOCLIMATIC STRATEGIES FOR CONTEMPORARY RESIDENTIAL ARCHITECTURE IN HOT ARID CLIMATES (CASE STUDY: MARRAKECH, MOROCCO)

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Problem statement. Contemporary mass housing construction in Morocco operates under significant climatic stress: summer temperatures reach 45°C, solar radiation exceeds 3,000 hours per year, and daily temperature fluctuations range from 15 to 20°C. The city of Marrakech, located in a hot semi-arid climate zone (BSh, Köppen classification), faces critical overheating and excessive mechanical cooling dependence. Modern mass construction systematically disregards local climate by applying glass curtain wall facades, open planning layouts, and minimal thermal inertia, resulting in severe reductions in energy efficiency and residential comfort.

Research purpose. To scientifically substantiate the bioclimatic principles and design strategies for contemporary housing under Marrakech conditions, and to validate them through an experimental design proposal for the Palmeraie site (~1 ha, near Ksar Char-Bagh hotel, Marrakech) [1].

Research results. Analysis of the traditional Moroccan architecture — medinas, riads, and kasbahs — demonstrates time-proven bioclimatic adaptation principles: an introverted spatial structure with a central courtyard-atrium as a thermal regulator; massive clay and natural stone walls of 50–80 cm thick with thermal lag of 10–14 hours; perforated mashrabiya screens providing diffuse lighting and natural aeration; minimization of exposed surfaces on sun-facing facades.

Comparative analysis of contemporary residential types in Marrakech identified five systemic errors: incorrect orientation without regard to solar azimuth; glass curtain wall facades (thermal transmittance U = 2.5–5.0 W/m²K);

absence of opening shading; low thermal inertia of reinforced concrete structures; and open planning layouts without mutual shading [3].

Based on climatic analysis of the Palmeraie site (dominant NW winds, daily ΔT = 15–20°C, relative humidity 20–35% in summer) [4], three interconnected bioclimatic strategies were defined for the design concept:

Table 1

Bioclimatic strategies for the Palmeraie site, Marrakech

Strategy	Mechanism	Effect
Passive cooling	Atrium effect + night ventilation of structures	Interior temperature reduction of 8–10°C
Solar shading	Mashrabiya screens + horizontal overhangs 1.5–2.0 m on S/W facades	Reduction of solar heat gain by 60–70%
Thermal inertia	Adobe, unfired brick, natural stone – wall thickness 40–60 cm	Thermal lag 10–12 hours, stable indoor climate

The proposed design concept for the Palmeraie site establishes an introverted residential cluster with a central atrium courtyard, NW-oriented main facades to maximize wind resource utilization, and a contemporary reinterpretation of traditional Moroccan architectural elements adapted to multi-story residential typologies.

Conclusions. Systematic analysis confirms that a bioclimatic approach can reduce cooling energy demand by 40–60% compared to conventional mass construction [2]. The integration of passive strategies, atrium structure, thermal inertia, and solar shading, combined with local zero-carbon materials (adobe, rammed earth, Atlas cedar), establishes a new residential environment model fully adapted to both the climate and the sociocultural context of Marrakech.

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STYLISTIC FEATURES AND THEIR REPRODUCTION IN UKRAINIAN TRANSLATION (BASED ON *THE MARTIAN CHRONICLES* BY RAY BRADBURY)

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Ray Bradbury's *The Martian Chronicles* is notable for its lyrical prose, dense imagery, and stylistic hybridity, combining science fiction with poetic narration. The Ukrainian translation by Oleksandr Terekh demonstrates a high degree of stylistic adequacy, achieved through a range of translation transformations and strategies. Next, we will consider the stylistic features observed in the novel and the corresponding translation transformations that were applied.

1) Metaphor and Imagery (Reproduction: Semantic Equivalence and Calque).

Bradbury's metaphorical language is largely preserved through semantic (denotative) equivalence and calque translation. For instance, the image of heat "as if someone had left a bakery door open" is translated as "хтось одчинив двері велетенської пекарні". This represents a direct metaphorical transfer with minimal transformation.

Similarly, "like a coin thrown into the sky" becomes "наче монета, яку підкинули вгору", illustrating formal equivalence combined with lexical calque, preserving both structure and imagery.

2) Repetition and Rhythm (Reproduction: Syntactic Parallelism and Compensation).

The repetition of "Rocket summer" is rendered as "Ракетне літо", maintaining syntactic parallelism. However, due to phonological differences, the exact rhythm cannot be fully preserved. This leads to partial phonetic loss, which is compensated by repetition frequency, an example of compensation in kind.

Parallel constructions in English are sometimes adjusted through transposition (change in grammatical structure) to conform to Ukrainian syntax, while preserving the cumulative stylistic effect.

3) Personification (Reproduction: Functional Equivalence).

Bradbury's personification ("the rocket made climates," "the heat pulsed") is reproduced through functional equivalence, e.g., "ракета перетворила зиму на літо", "тепла хвиля прокотилася". Here, the translator applies modulation (in perspective), transforming literal constructions into more natural Ukrainian expressions while retaining stylistic function.

4) Sound Imagery (Reproduction: Modulation and Stylistic Compensation).

Expressions such as "a soft ancient voice" are translated as "тихий голос далекої старовини". This involves modulation, as the adjective "ancient" is

expanded into a descriptive phrase. Musical elements ("sang," "hummed") are preserved through stylistic equivalence, though sometimes intensified lexically, demonstrating expressive concretization, a subtype of explicitation.

5) Exotic Lexicon (Reproduction: Foreignization vs Domestication).

Bradbury's alien imagery ("crystal pillars," "metal books," "flame birds") is translated via calque: "кришталеві колони," "металеві книги," "полум'яні птахи".

This reflects a foreignisation strategy, preserving the strangeness of the source text rather than adapting it culturally. The translator avoids domestication, thereby maintaining the exotic semantic field.

6) Similes (Reproduction: Formal Equivalence and Minimal Transformation). Similes such as "like bears" are translated as "наче ведмеді", demonstrating formal equivalence with minimal transformation.

In most cases, similes are transferred directly, indicating a preference for literal translation where stylistically feasible.

7) Dialogue (Reproduction: Pragmatic Adaptation and Explicitation).

Bradbury's concise dialogue ("A dream?" / "Yes") is preserved structurally in Ukrainian ("Сон?" / "Так"), reflecting syntactic equivalence.

However, emotional nuances are sometimes enhanced through pragmatic adaptation and explicitation, e.g., intensifiers like "Що це за нісенітниця!". This reflects the translator's effort to match communicative effect.

8) Grammatical Transformations (Reproduction: Transposition and Expansion).

Due to typological differences, the translation frequently employs:

- Transposition (e.g., verb → noun structures),
- Expansion (explicitation) to clarify implicit meanings,
- Occasional reduction (implicitation) where context allows.

For example, compact English constructions are often expanded in Ukrainian to preserve clarity and stylistic richness.

The Ukrainian translation of *The Martian Chronicles* demonstrates a balanced application of translation strategies, including calque, modulation, transposition, explicitation and compensation. The translator achieves a high level of functional and dynamic equivalence, successfully preserving Bradbury's poetic imagery, rhythm, and emotional tone. Although certain phonetic and syntactic features transform, the overall stylistic integrity of the original is maintained.

NARRATING TWENTIETH-CENTURY HISTORICAL TRAUMA IN IAN McEWAN'S *LESSONS*

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The way Ian McEwan tells the story in *Lessons* is not just about looking back at one man's life during big changes in the 20th century. It is more like an unstable, time-shifted, and morally difficult space. In this space, personal pain, seen through broken memories and shared stories, cannot be separated from how we understand history. History itself is something we can only talk about, put off, and understand again and again.

A very strong idea in this story is how Roland Baines becomes who he is. Painful events come back to him again and again. The most important are when Miriam Cornell hurt him sexually, and when Alissa Eberhardt left him without a reason. These events are hard to understand right away. Instead, they stay in his mind and come back later – through sudden memories, broken storytelling, and strong feelings. This shows a kind of trauma that is not just in the past. It is not closed. It grows over many years and becomes a way of living.

The book does not tell time in a straight line. It uses short scenes, moves back and forth in time, and looks back at the past. This is not just a strange style. It is a way to show that trauma comes late. Meaning does not come before telling the story. It only comes through slow talking, missing pieces, and new ways of seeing things. So, the story itself is both where trauma appears and the only way to get to it a little – but never fully solve it.

This becomes even more complicated because of testimony. In *Lessons*, testimony is a dialogue, not just one person speaking. It does not give a simple ending. Instead, it shows that talking about trauma is ethically and factually unstable. When Roland meets Miriam again, or when he talks to Alissa, nothing is solved. They do not make peace. Instead, we see many ways to understand the past. Each story shows something and hides something else. Each one says "yes" or "no" to responsibility.

Also, Alissa's testimony comes both when she speaks directly and when she writes about Roland in her own books. This adds another layer of storytelling. She changes Roland in her fiction. This breaks the line between truth and lies, memory and invention. Roland – and the reader – must see that different stories can be true at the same time. They cannot be put together into one simple truth. This shows that personal and historical truth are many and never fixed.

A way, the book's looking at trauma can be understood using Dominick LaCapra's ideas:" acting out" (living the pain again) and "working through" (slowly

understanding it). These are not steps toward getting better. Instead, Roland moves back and forth between them. He often returns to his past without letting it go. But the times when he shares his story with others help him change how he sees things. This gives him a small kind of power. It does not remove the trauma, but it puts it in a bigger story about who he is.

But the most important thing is that this process is never finished. This is what makes the book special for trauma studies. *Lessons* says no to the idea that trauma can be beaten. Instead, it says trauma stays with you. It becomes part of who you are. It changes how you see, remember, and live your whole life. This goes against normal stories of healing that need a clear ending, a big emotional release, or a simple moral answer.

So, McEwan changes what testimony is for. It is not a way to finally understand everything. It is a practice that is always happening and always morally difficult. Through testimony, people try to manage the unstable relationship between past and present, self and others, memory and history. This creates a kind of storytelling that is always open, never finished, and deeply connected to the big cultural and historical forces through which trauma is both shown and felt again.

Finally, *Lessons* shows a version of 20th-century historical trauma that is not kept inside single events. It is also not solved by telling a story. Instead, it stays as a changing condition. It asks for constant work, flexible understanding, and accepting that things are not clear. In this way, the book is an important look at the limits of telling stories and the deep difficulty of living with trauma after history has happened.

ARK NOVA: INNOVATIVE ARCHITECTURE AS A SYMBOL OF RECOVERY AND RENEWAL

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The seismic events of March 2011 in Japan resulted in profound physical destruction and a collective sense of loss. In a move to foster healing, the Lucerne Festival joined forces with Kajimoto to launch a symbolic initiative: "Ark Nova – A Tribute to Higashi Nihon." This collaboration birthed the world's inaugural inflatable mobile concert venue, a masterpiece co-created by architect Arata Isozaki and sculptor Anish Kapoor. Beyond its utility as a performance stage, the structure stands as a testament to the resilience of the human spirit and the power of cultural reclamation.

Fig. 1. Ark Nova Inflatable Concert Hall

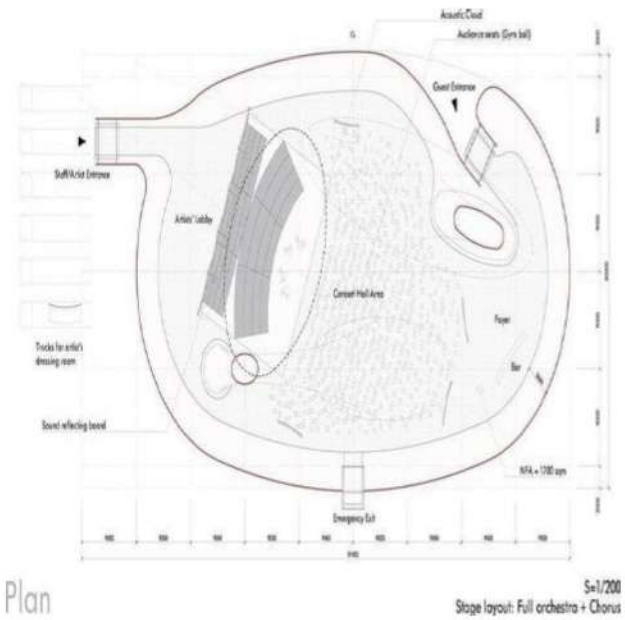

Fig. 2. Ark Nova Plan

The name "Ark Nova" combines the biblical concept of an ark with the Latin word meaning "new." While the original ark saved lives from the flood, "Ark Nova" aims to bring culture and music to disaster-stricken regions, serving as a vehicle for new beginnings. The project also references the Japanese concept of "Marebito" (sacred guests): people from other countries who bring their festivals and customs to revive a community's culture. Traveling through disaster-stricken areas, the platform interacts with local residents, creating new forms of artistic activity, or "Ark Nova."

Technically, the Ark Nova is an impressive of engineering. The structure is composed of a polyester membrane with a 0.63 mm thick PVC coating and weighs 1,700 kg. When fully inflated, the hall has a volume of over 9,000 m^3 and dimensions of 29 x 36 x 18 meters. The shell was designed by Aerotrope in collaboration with Anish Kapoor. Unlike traditional inflatable structures, which typically take a spherical shape, the Ark Nova has a striking toroidal (doughnut) shape. This shape curls in on itself, forming an internal tube that serves as a supporting structure and prevents sound from focusing in one spot, thereby significantly improving acoustics.

The interior architecture of the pavilion encompasses a versatile floor area of 680 m^3, facilitating a variable occupancy capacity ranging from 500 to 700 spectators. The auditorium is engineered with a multi-form theatrical layout, providing the modularity required to accommodate a diverse spectrum of performance arts—from traditional Japanese choreography to complex contemporary orchestral compositions. A significant element of the interior's phenomenology is the provenance of its furnishings. The seating structures are fabricated from ancient Japanese cedar (Cryptomeria japonica) reclaimed from the

Zuiganji Temple in Matsushima. These specimens were either uprooted or rendered non-viable during the 2011 seismic event.

The visual experience of Ark Nova is equally arresting. The bespoke tensile fabric appears opaque purple from the outside but glows as a translucent red from the inside. This translucence allows for organic changes in light levels, unifying the audience within Kapoor's art. Because the structure has no steel support and is repeatedly collapsible, it can be folded, loaded onto a truck, and re-inflated at a new location in a short period. Ark Nova represents a rare synergy where the boundaries between sculpture and architecture disappear. The membrane's translucency and organic shape redefine the relationship between the viewer and the built environment.

Fig. 3. The Ark Nova Concert Hall at night using interior lighting

In conclusion, Ark Nova pushes the boundaries of inflatable design and tensile engineering. By combining the artistic vision of Anish Kapoor with the architectural precision of Arata Isozaki and the acoustic expertise of Yasuhisa Toyota, the project has created a mobile sanctuary for the human spirit. It proves that architecture can be both temporary and resilient, providing a space where music and art can help a community navigate the aftermath of a tragedy and look toward a "new" future.

MODERN SEISMIC ISOLATION TECHNOLOGIES IN JAPANESE ARCHITECTURE AND CIVIL ENGINEERING

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Japanese architecture and civil engineering are an interest of many technological experts across the world. Their ability to build incredibly tall and stable structures in a very challenging and seismically active environment is really astonishing. Therefore, this paper is an intention to concentrate primarily on their distinctive methods and technologies enabling their accomplishment.

Fig.1. Tokyo Skytree

Modern Japanese architecture is a perfect example of how high-tech engineering can meet complex urban needs. Since Japan is located in one of the world's most seismically active zones, it has naturally become a global leader in structural design. For future civil engineers, studying the Japanese approach is essential to understand modern safety standards. The way their construction has evolved - from ancient wooden pagodas to cutting-edge carbon fiber skyscrapers - clearly shows their endless search for better disaster resilience.

Seismic Isolation and Vibration Control Systems. Modern Japanese construction is based on three main concepts: **Taishin** (structural resistance), **Seishin** (vibration control), and **Menshin** (seismic isolation). Unlike standard rigid structures that absorb earthquake energy through deformation—which often leads to destruction—modern Japanese buildings are designed to decouple from the ground motion or actively counteract it.

The **Menshin** technology, also known as base isolation, is currently the most effective method used in Japan for high-rise residential and office buildings. This technology involves placing specialized lead-rubber bearings (LRB) or dampers between the foundation and the main structure. These bearings act as an absorber, allowing the ground to move rapidly while the building itself moves much slower and with less amplitude. According to technical reports by **Nikken Sekkei**, such systems can reduce the seismic forces acting on the building's frame or foundation by 70-80%.

For ultra-high-rise structures, where base isolation is less effective due to wind loads, Japanese engineers use Tuned Mass Dampers (TMD). A famous example is the **Tokyo Skytree** tower, which is 634 meters tall. It features a massive central column called '**Shimbashira**', inspired by the design of ancient pagodas.

This central concrete tube is detached from the outer frame, allowing the two parts to vibrate at different frequencies and cancel out each other's oscillations during an earthquake or a typhoon. **Urbanism and Material Innovation.** Modern Japanese urbanism is characterized by the '**Compact City**' model, which is especially noticeable in major cities like **Tokyo, Osaka, and Nagoya**. Due to the extreme lack of space in Tokyo and Osaka, engineering solutions focus on multi-level infrastructure and deep underground construction. One of the greatest engineering marvels is the **G-Cans** project: - a massive underground water discharge system that protects the capital from floods.

Furthermore, there is a significant shift towards '**Green Engineering**' and sustainable materials. Japan is currently a leader in the use of **Cross-Laminated Timber (CLT)** in skyscraper. Projects like the '**W350**' aim to build a 350-meter wooden skyscraper by 2041. CLT panels are not only environmentally friendly but also offer a high strength-to-weight ratio, which is excellent for seismic stability.

Fig 2. W350 plan

Conclusion. Japanese construction standards serve as a benchmark for global civil engineering. The integration of advanced damping systems, innovative materials, and smart urban planning ensures the resilience of even the densest and tallest metropolises. Among Ukrainian civil engineers, there is a strong belief that the Japanese experience in using modular construction systems and seismic dampers is extremely valuable for our future infrastructure restoration projects. Japanese engineers demonstrate that engineering is not just about building structures, but about creating a safe, comfortable, and practical environment through constant technological adaptation.

ROLE OF THE EDUCATIONAL ENVIRONMENT IN DEVELOPING STUDENTS' PROFESSIONAL COMPETENCIES

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In modern society, education plays a crucial role in preparing qualified and competitive professionals. Rapid changes in science, technology, and communication require new approaches to the organization of the educational process. In this context, the creation of an effective educational environment

becomes an important factor in the development of students' professional competencies and the improvement of the overall quality of education.

The educational environment can be defined as a complex system of conditions, factors, and resources that influence the learning process and the development of students' personalities. It includes material and technical resources, teaching methods, information technologies, and social interaction among participants in the educational process. A well-organized educational environment creates favorable conditions for increasing students' motivation, cognitive activity, and professional development.

One of the most important elements of a modern educational environment is the use of innovative pedagogical technologies. Interactive teaching methods, project-based learning, digital educational resources, and online platforms make the learning process more flexible and effective. These approaches help students not only acquire theoretical knowledge but also develop practical skills that are necessary for their future professional activity.

The use of modern technologies in education allows teachers to create a more engaging and dynamic learning environment. Students are encouraged to participate actively in discussions, group projects, and problem-solving tasks. Such activities promote the development of critical thinking, communication skills, and the ability to work collaboratively. As a result, students become more independent and responsible for their own learning outcomes.

The interaction between teachers and students also plays a significant role in the formation of an effective educational environment. Modern pedagogy increasingly focuses on a partnership model of education based on cooperation, dialogue, and mutual respect. In such an environment, students feel more confident expressing their opinions, asking questions, and sharing ideas. This type of communication helps build trust and supports the development of a positive learning atmosphere.

Another important aspect of the educational environment is the implementation of a learner-centered approach. This approach takes into account the individual needs, interests, and abilities of each student. By considering these factors, teachers can create more effective learning strategies and support the personal and professional growth of students.

A supportive psychological climate is also essential for the successful functioning of the educational environment. When students feel respected and supported by teachers and peers, they are more likely to be motivated and actively involved in the learning process. Positive relationships within the educational community contribute to the development of responsibility, creativity, and initiative among students.

Thus, the educational environment plays a key role in the development of students' professional competencies. Its effective organization requires the integration of innovative pedagogical technologies, active interaction between teachers and students, and the creation of a supportive psychological atmosphere. These conditions contribute to the preparation of highly qualified specialists who are able to adapt to modern professional challenges and successfully realize their potential in their future careers.

ASSESSMENT OF CONDITION AND STRENGTHENING METHODS OF DETERIORATED STEEL STRUCTURES

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The long-term operation of academy steel structures inevitably leads to a gradual decrease in their performance characteristics. Despite the high strength and reliability of steel, structural elements are exposed to corrosion, cyclic loads, and environmental influences, which contribute to the accumulation of damage. In such conditions, the assessment of the technical state and the selection of appropriate strengthening methods become critical tasks aimed at extending the service life of structures and ensuring their safe operation.

The purpose of this study is to analyze modern approaches to the assessment of the condition of deteriorated steel structures and to systematize the main methods of their strengthening.

The evaluation of structural condition is a multi-stage process that includes visual inspection, instrumental diagnostics and analytical calculations. During operation metal elements may develop corrosion damage, fatigue cracks and local deformations. At the same time fatigue phenomena, caused by repeated loading, accelerate crack propagation, which may result in sudden structural failure. Corrosion processes significantly affect the mechanical properties of steel and lead to a reduction in load-bearing capacity according to scientific studies [2].

A key difficulty in assessing steel structures lies in the fact that the actual condition of elements often differs from design assumptions. Hidden defects, such as internal cracks or welding imperfections, require the use of non-destructive testing methods, including ultrasonic and magnetic inspections. Modern approaches also involve structural health monitoring systems that allow continuous tracking of the state of critical elements. As noted in research, the use of advanced diagnostic techniques improves the accuracy of residual life prediction and supports more effective decision-making [3].

Based on the obtained assessment results, appropriate strengthening methods are selected. The choice of technique depends on the type and extent of damage, as well as operational requirements. One of the most common approaches is the installation of additional steel elements, which allows redistribution of internal forces and reduction of stresses in weakened zones. Another widely used method is the enlargement of cross-sections through welding or bolting of reinforcing plates.

In cases of significant deterioration, partial or complete replacement of damaged elements may be required. Studies indicate that strengthening methods should be selected with consideration of both structural efficiency and economic feasibility [4]. In addition, modern engineering practice increasingly applies composite materials and hybrid solutions, which provide high strength with relatively low additional weight.

Environmental conditions play an important role in both degradation and strengthening processes. Structures, located in aggressive environments, require not only mechanical reinforcement, but also protective measures against further corrosion, such as coatings or cathodic protection systems. It is emphasized that neglecting environmental factors may significantly reduce the effectiveness of strengthening measures and lead to repeated deterioration [2].

In current conditions, particular attention is paid to safety and reliability requirements. Strengthening solutions must ensure compliance with modern standards and account for possible increases in loads or changes in operational conditions. This requires a comprehensive approach that combines accurate assessment, rational design and proper execution of reconstruction works.

The conducted analysis shows that the assessment of condition and strengthening of deteriorated steel structures are closely interconnected processes. The accuracy of diagnostics directly influences the effectiveness of selected reinforcement methods. Their combined application is allowed for extending the service life of structures and improving their operational reliability.

Further research should be focused on the development of integrated methods that combine monitoring systems, predictive models and innovative strengthening technologies to enhance the efficiency of reconstruction processes.

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CONSTRUCTION AND DESIGN

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Today, architecture is no longer static. We are moving from the era of "concrete brutalism" to adaptive design. The main question of today's life may be this: how can we make a building not just a point on a map, but an extension of the landscape and human needs?

The first and most significant driver of transformation is biophilic design. It is a strategy that integrates natural elements directly into the architectural fabric. This is not just about greening building facades, but about deeply simulating natural processes. The use of natural light, water features, and plant modules helps create spaces that lower residents' cortisol levels. The design of the future draws on the concept of "fractality": - the repetition of complex natural forms that our eyes perceive as the most pleasing.

The second aspect is a rethinking of materials science through the lens of design. We are seeing a return to "material honesty": concrete is not disguised as plaster, wood reveals its texture, and stone retains its natural imperfections. Parametric design allows for the creation of complex and fluid forms that were previously impossible to achieve. The use of 3D printing in construction paves the way for the customization of every detail, making the design exclusive yet accessible. In contemporary design, light is a fully-fledged building material. The design approach involves working with scenario-based lighting that alters the geometry of a space depending on the time of day or the user's needs.

The third aspect is that, in a world of information overload, a building's design should act as a filter that cuts out the unnecessary. This is the "less is more" philosophy, where every line has a logical purpose and every square meter of space is valuable. A space should be intuitive and comfortable for everyone. Design today is not about how a building looks in a photo, but about how people feel inside it. It is a shift away from mere ornamentation toward substance, where aesthetics arises from clean proportions and respects for people.

To sum up all of the above, we can conclude that every detail is intentional, and every new reinterpretation is a step toward perfection. "Form follows function" – said Louis Sullivan.

PROBLEM OF MORAL CHOICE IN MODERN SOCIETY

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Modern society is developing very rapidly, and these changes strongly influence everyday life. Technologies continue to advance, the amount of information is constantly increasing, and it is often difficult to distinguish reliable information from false or misleading content. In such conditions, people increasingly face situations that require not only practical decisions but also moral choices. In other words, individuals must determine how to act correctly according to principles of conscience, responsibility, and ethics.

A moral choice can be understood as a decision between different forms of behavior in which a person considers not only personal benefit, but also moral values and social responsibility. In everyday life, moral choices are not always connected with major events. Very often they appear in ordinary situations, such as telling the truth or remaining silent, helping another person or ignoring their problems, keeping a promise or breaking it. Such actions gradually shape a person's character and behavior.

In more traditional societies, moral norms were usually clearer and more stable. People were more strongly guided by religion, customs, and the opinions of the community. In modern society, individuals have much greater freedom, but this freedom is accompanied by greater responsibility. As a result, it is sometimes difficult to determine the correct course of action because many situations do not have one clear or universal answer.

The internet and social media have a significant influence on moral decision-making today. On the one hand, they provide quick access to information, communication, and current events. On the other hand, digital platforms often contain manipulation, misinformation, and emotional pressure. As a result, people may unconsciously form opinions under the influence of the content they consume daily. This makes it more difficult to remain objective and independent in one's judgments.

Another important issue is the influence of consumer culture. Modern society often promotes the idea that success, financial wealth, and quick results are the main indicators of achievement. Because of this, individuals may experience conflicts between moral principles and personal advantage. For example, a person may understand the importance of honesty but still choose actions that provide personal benefit through dishonest means. Such situations represent common examples of moral conflict in contemporary society.

Family and education play a crucial role in the formation of moral values. The principles and attitudes developed during childhood strongly influence a person's future behavior. When children are taught the importance of honesty, responsibility, and respect for others, they are generally better prepared to make ethical decisions later in life. Education is also essential because it develops not only knowledge, but also critical thinking and the ability to analyze complex situations.

From a philosophical perspective, the problem of moral choice has existed for centuries. For example, Immanuel Kant argued that a person should act according to principles that could become universal rules for everyone. This idea emphasizes the importance of fairness and personal responsibility. However, in real life moral decisions are often more complicated because circumstances may vary and ideal solutions are not always possible.

Although moral choices in everyday life may appear insignificant, they continuously influence the development of personality and social relationships. Communication with others, attitudes toward society, and reactions to the difficulties of other people are all connected with moral responsibility.

This issue is especially important for young people who are still forming their worldview and system of values. Modern youth are exposed to a large amount of information, different opinions, and various forms of influence, which can make it difficult to determine what is truly important. Therefore, it is essential to develop independent thinking, critical analysis, and the ability to preserve personal values despite external pressure.

In conclusion, moral choice is an essential part of human life and accompanies individuals in both major and everyday situations. It is influenced by upbringing, social environment, personal experience, and internal beliefs. Although the modern world makes moral decisions more complex, these choices continue to reflect a person's true character and values.

IMPLICITNESS AND UNDERSTATEMENT: TRANSLATING HIDDEN MEANINGS IN POST-APOCALYPTIC DISCOURSE

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Post-apocalyptic discourse is characterised by a fundamental incompleteness of expression: a significant portion of meaning exists not in the form of explicit statements, but as subtext, implication, or silence. In this respect, *The Road* by Cormac McCarthy serves as an exemplary case, where implicitness becomes the primary mechanism of meaning-making. The language of the work is

as "scorched" and minimalist as the world it depicts, which gives rise to specific challenges in translation.

Implicitness in the novel operates on several levels: lexical, syntactic, and discursive. The author deliberately avoids providing detailed explanations of the causes of the catastrophe, refrains from specifying spatiotemporal coordinates, and minimises motivational accounts of the characters' actions. As a result, an effect of indeterminacy is created, which intensifies the emotional impact of the text. The reader is compelled to reconstruct the context independently, thereby becoming a co-creator of meaning.

One of the key features of McCarthy's style is syntactic reduction. First and foremost, punctuation should be considered as a means of understatement. McCarthy almost entirely omits quotation marks in dialogue and reduces the use of punctuation to a minimum. For example, a dialogue may be presented as a continuous flow of utterances without clear demarcation between speakers. Such a form creates an effect of blurred boundaries between voices and underscores the degradation of structured speech.

Ellipsis is particularly illustrative in dialogues. The dialogues in the novel demonstrate an extreme degree of conciseness. The phrase "to carry the fire" is not explained, yet it functions as an implicit metaphor for humanity. Any attempt to add clarification ("the fire of hope," "the fire of life") would destroy its symbolic polysemy.

Another important aspect is the use of rare and specialised vocabulary. For example, words such as *glaucous* (bluish-green), *vermiculate* (worm-like), and *crozzled* (charred) perform not only a nominative but also a symbolic function. They create the impression of a language that is "dying along with the world." The translator should avoid simplification (for instance, replacing them with *зелений* or *обгорілий*) and instead select fewer common equivalents, such as *блакитнуватий*, *звивистий*, or *обвуглений*. In this way, the effect of lexical archaism and intellectual tension is preserved.

Another important example is an everyday detail as a carrier of cultural implicitness. The scene in which the characters find a can of Coca-Cola goes beyond a simple description. It is a symbol of the lost world of abundance, childhood, and stability. In translation, the brand name must be preserved unchanged, as it functions as a universal cultural marker.

An important aspect is the rendering of emotional restraint. McCarthy avoids explicit evaluations and does not impose an interpretation of events on the reader. Emotions are conveyed through actions, repetition, and silence. In target languages, there is a tendency to intensify expressiveness; however, in this case, such a strategy is misguided. The translator must consciously control the

emotional colouring, preserving the "emotional asceticism" of the text as a key feature of the author's style.

Descriptions of nature in the novel also function as carriers of implicit meaning. The world is presented through shades of ash: *ash, cinder, char*. Translation requires a precise selection of equivalents (*попелястий, чадний, обвуглений*) that convey different "textures of death." For example, the image "the mummied dead," referring to trees, can be rendered as *муміфіковані мерці*, emphasising the complete absence of life.

The preservation of implicitness has a direct impact on the perception of the text. First, it creates an effect of co-creation: the reader "fills in" the reality themselves. Second, it produces a sensory deprivation – a feeling of fatigue and desolation. Third, restraint enhances the credibility of the text, creating an effect of documentary authenticity. Finally, implicit metaphors ensure a profound existential resonance.

The translation of post-apocalyptic discourse is a complex process of interpreting "visible silence." The translator's task lies not only in reproducing words, but also in preserving their absence as a carrier of meaning. Only through a precise balance between explication and understatement can an adequate translation be achieved – one that conveys the multi-layered nature and philosophical depth of the original.

INFORMATION TECHNOLOGIES AND DIGITIZATION PROCESSES

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The rapid evolution of information technologies (IT) has become the primary driver of global digitization, fundamentally transforming economies, societies, and public administration. Digitization refers to the conversion of analog information into digital formats, while digital transformation involves the broader integration of these technologies to reshape business models, processes, and customer experiences. In the mid-2020s, this process is accelerating due to advancements in artificial intelligence (AI), cloud computing, the Internet of Things (IoT), edge computing, and 5G networks.

Globally, digital transformation spending reached approximately $1.85 trillion in 2022 and is projected to approach $3.9 trillion by 2027, with a compound annual growth rate (CAGR) supporting sustained expansion. By 2030, the market is expected to exceed $3 trillion. AI and generative AI stand out as the dominant forces, with over 95% of firms investing in AI initiatives. Hyperautomation is anticipated to be adopted by 90% of organizations by the end of 2025. Key

complementary trends include cloud-native architectures, edge computing for real-time data processing, and enhanced cybersecurity measures amid rising threats.

These technologies enable data-driven decision-making, operational efficiency, and new business models. For instance, AI-powered automation streamlines workflows, while IoT and 5G facilitate connected ecosystems in manufacturing, healthcare, and logistics. Blockchain enhances trust and security in transactions, and hybrid cloud strategies provide scalability and resilience.

In Ukraine, digitization serves as a cornerstone of economic resilience, especially amid ongoing challenges. The country has made notable progress through the "Diia" ecosystem, which has over 23 million users and facilitates seamless public services. Internet penetration reached 82.4% in early 2025 (31.5 million users), with strong mobile connectivity. The national Digital Transformation Index of Regions rose to an average of 44.9 points out of 100 in 2025, reflecting improvements even in frontline areas. Ukraine's IT sector remains robust, with significant export growth and a focus on miltech and software development.

Ukraine's digital strategy emphasizes AI integration (including a national AI strategy targeting 1,000 domestic AI companies by 2030), cybersecurity, interoperable registers like Trembita, and alignment with EU standards. These efforts support post-war reconstruction, e-governance, and innovation. However, challenges persist, including uneven adoption among SMEs, infrastructure disparities in regions, and the need for enhanced digital literacy and cybersecurity.

The synergy between IT and digitization processes yields substantial benefits: increased productivity, innovation, inclusivity, and competitiveness. Nevertheless, successful implementation requires addressing ethical considerations, data privacy, skills gaps, and equitable access. Future trajectories point toward ambient intelligence, agentic AI, and sustainable digital infrastructures.

In conclusion, information technologies are not merely tools but foundational enablers of modern development. For Ukraine, leveraging these processes is essential for building a resilient, innovative, and digitally sovereign economy integrated into the European digital single market. Continued investment in education, infrastructure, and policy coherence will determine the long-term success of this transformation.

ANALYSIS OF THE EXPERIENCE OF USING UNDERGROUND GAS PRESSURE REGULATING STATIONS

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Gas pressure regulating stations (GRS) in gas distribution systems of Ukraine are located in attached buildings, integrated into single-story industrial buildings and boiler houses, in separate buildings or blocks; that is, any GRS has an above-ground location. According to the requirements of current regulatory documents [1], gas pressure regulating stations may be installed both above-ground and underground. Underground placement of GRS is a new technical solution for gas supply systems of Ukraine. The issue of safe placement of gas pressure regulating stations is especially relevant during martial law.

The aim of this study is to analyze foreign experience in the use of underground gas pressure regulating stations (UGRS), existing technical solutions for their placement, and design requirements.

Underground GRS are used in Germany, the United Kingdom, Ireland, Taiwan, the Czech Republic, Poland, Hungary, etc. [2]. Underground placement of gas pressure regulating stations is particularly relevant in dense urban environments, where it is difficult to comply with standardized distances from the installed GRS to buildings, structures, railway and tram tracks, overhead power lines, etc., as well as when there is a need to reduce noise from technological equipment. Underground regulating stations are a good alternative to cabinet-type regulating stations installed on building walls or separate supports. UGRS occupy little surface space, therefore they are installed in historical districts, parks, and recreational areas. Underground placement eliminates the cost of constructing and heating a GRS building, reduces land allocation and exclusion zones, and increases protection of equipment from unauthorized access and vandalism [2].

Among manufacturers of gas regulating equipment, there are companies that produce underground gas pressure regulating stations, including: Tartarini (Italy), Pietro Fiorentini (Italy), Francel (France), RMG Regel+Messtechnik GmbH (Germany–United Kingdom), Autometers Energitec Limited (India–Germany), manufacturers within Emerson Process Management Corporation (USA), and others.

An underground gas pressure regulating station is a set of equipment manufactured and fully assembled at the producer's facility, containing all standard elements of a gas pressure regulation unit: a filter, safety shut-off valve devices and/or a monitor regulator, a pressure regulator, shut-off valves, instrumentation, and a relief device. The regulating unit of the UGRS is placed in a

metal container equipped with appropriate connections for inlet and outlet gas pipelines.

Underground installations have a control and vent stack located above ground at some distance from the regulating unit. The stack contains vent pipes of the instrumentation compartment and discharge pipes, as well as indicator displays, allowing readings to be taken without removing the protective cover of the container. Instruments are installed in the control stack and connected to the underground unit by measuring tubes and cables. UGRS may also include electronic units and telemetry devices for transmitting gas parameters to a dispatch center.

Technical characteristics of block-type gas pressure regulating stations installed below ground level vary widely depending on their application. Their capacity ranges from 10 m^3/h to 1500 m^3/h, inlet gas pressure may be up to 0.6 MPa or up to 1.9 MPa (such pressure is not used in urban gas distribution systems of Ukraine), outlet pressure range is 1.5–400 kPa, and operating temperature ranges from –10°C to +60°C [2,3].

The distance from the container wall of a UGRS or from above-ground devices technologically connected to buildings and structures is taken the same as for a standalone cabinet-type GRS. > Sofia: European standards recommend smaller distances similar to those for underground gas pipelines of the corresponding pressure category at the inlet to the UGRS [1].

Reference also states the need to prevent vehicle movement over the UGRS or to ensure that the container cover has sufficient load-bearing capacity for possible surface loads above it. In Frankfurt am Main, a gas network reconstruction project included relocating an existing above-ground GRS located on a square underground; the container cover of this unit can withstand heavy trucks with a wheel load of 50 kN [4].

Thus, underground gas pressure regulating stations the most widely used when there is no available space in the project area for above-ground GRS placement. The use of UGRS during wartime is alloued for safer and more reliable gas supply to consumers. Underground GRS contain all standard elements of gas pressure regulation units, have a wide range of technical characteristics, and are convenient to operate. The requirements of the Ukrainian regulatory documents for the placement of underground GRS differ from European standards.

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ENVIRONMENTAL SAFETY IN BUILDING MICROCLIMATE SYSTEMS

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This paper gives a possible solution to ensure indoor climate of buildings with the possibility of reducing pollution and maintaining internal cleanliness.

The functioning of life-support systems of buildings is associated with the consumption of thermal, electrical and other forms of energy and their production is connected with technological processes. Any technological process inevitably leads to the environmental degradation [1]. Therefore, the primary environmental objective in the operation of such processes is to reduce their negative impact on the environment.

At the present stage of development of the construction industry, particularly in the design of life-support systems of buildings, the issue of maintaining environmental cleanliness within indoor spaces has also become increasingly significant [2]. Thus, alongside with global environmental protection measures, this problem also needs to be solved.

The tasks of ensuring a proper indoor microclimate in buildings through reducing environmental pollution and improving indoor air quality can be achieved by the following approaches:

- reducing the consumption of non-renewable energy resources through the use of renewable energy sources (solar, wind, etc.) [3];
- decreasing overall energy consumption;
- improving technologies for maintaining indoor microclimate conditions in order to enhance occupant comfort [4].

One of the promising directions in the development of modern energy systems is the application of renewable energy sources for heating and cooling supply in life-support systems of building, based on thermally driven units for combined heat and cold production, namely, absorption heat transformers (AHT) [5]. AHT systems are characterized by high efficiency, environmental friendliness, low noise levels during operation and long service life.

The reduction in energy consumption can also be achieved by lowering the thermal load of systems through the thermal retrofitting of buildings [6], as well as by managing the thermal regime of building, using the programmed control accounting and regulation systems [7].

Optimization of air exchange (reducing the supply airflow to standardized levels) and the use of natural air movement drivers are also key factors in energy conservation [8]. To solve the problem of reducing energy consumption it is proposed to use a two-stage control scheme for indoor microclimate parameters (general and local control), using logical control centers and modern sensor technologies [9].

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TYPES OF ROOFING MATERIALS

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The roof is not only a protection of the house from precipitation and wind, but also an important part of its architecture, which can set the style of the building, decorate it and ennoble it. Today, the construction market offers a variety of roofing materials, diverse in technical characteristics and appearance. Roofing slate, bitumen shingles, polycarbonate, corrugated board, folded roofing, slate, various types of tiles: flexible, ceramic, composite, metal tiles, etc.

Metal tile is a lightweight, practical, easy-to-install and reliable roof made of galvanized steel with a double-sided

polymer protective coating. The basis of metal tile is a hot-rolled galvanized sheet (0.4 - 0.5 mm thick), which undergoes a process of passivation, priming and coating with a colored polymer layer, which gives the roof color and protects it from corrosion. The sheets are formed under the profile of natural tiles and allow you to give the roof an exquisite look of an old tiled coating for a relatively moderate budget.A metal tile roof can withstand both severe frosts and exhausting heat and adapts perfectly to sudden changes in temperature. The surface of this roof prevents the accumulation of any type of precipitation.

Pros: ease of installation, long service life, lightness, environmental friendliness, resistance to temperature changes, fire resistance, competitive price, rich color range of the material and variety of profiles, possibility of rapid descent of precipitation (due to the smoothness of the roof) and low weight. **Cons:** high sound conductivity (to eliminate it, it is necessary to install sound insulation), high consumption of building material when installing a roof of complex construction, possibility of gradual burnout of the material, susceptibility to scratches, high thermal conductivity, and need to install a lightning rod.

Ceramic tiles are a natural roofing material that is made by forming clay mass, then drying it and firing it in ovens at a temperature of about 1000 degrees. Ceramic tiles have been known since ancient times, but they have not lost their popularity even now: for example, in central and western Europe more than 80% of buildings are covered with ceramic tiles. This type of roof is valued for its naturalness, beauty and practicality. Clay tiles are able to withstand the change of seasons with dignity: heat, cold, wind, heavy rainfall. Under a roof made of this roofing material, it will be warm in winter and cool in the summer months. Due to the naturalness of this tile and the method of its installation, which leaves gaps between the roof and the building part of the structure, the roof can "breathe", which contributes to a comfortable life in the house. The durability of ceramic tiles has been proven over the centuries: - this coating can last for more than a hundred years, remaining the same solid, rich and aristocratic. Natural ceramic roofing can give a house a special elegance and add a zest to its architecture. Ceramic tiles are used for cladding roofs with a slope of 20 to 60 degrees. If the roof has a slope of less than 16 degrees, it is better to make cladding from a solid deck.

Pros: excellent decorative qualities, high service life, fire resistance, high heat and sound insulation, naturalness, environmental friendliness, reliability, strength, corrosion resistance, low water absorption, resistance to temperature

extremes, minimal waste; over time, the tile does not lose its beauty. **Cons:** high weigh (40-60 kg per square meter), high cost, laborious and difficult installation, limited color range and fragility.

Bitumen shingles (flexible, soft roofing) is a multilayer roofing material composed of SBS-modified bitumen, colored mineral granules, and fiberglass.

Today, flexible shingles are one of the most in-demand and common roofing materials due to their practicality, cost-effectiveness, wear resistance, and light weight. They can serve as an excellent covering for any type of roof, including sloped ones, with complex surfaces, ridges, dormer windows, etc. Due to its elasticity, bitumen shingles can cover a surface with a tight, impervious layer, blocking access to moisture and precipitation.

This covering handles both frost and heat perfectly, is resistant to corrosion, shrinkage, and roof construction movement. By creating a roof with soft shingles, you don't have to worry about the annoying noise of rain, hail, and strong wind gusts; due to its softness, it is able to absorb external noise. Another advantage of flexible shingles is their cost-effectiveness. Even on the most complex types of roofing, waste after installation is only about 5%.

Today, soft roofing is represented by a wide range that can satisfy the needs of even the most fastidious and demanding designer. Modern **bitumen shingles** have many color shades and shapes (hexagon, wave, honeycomb, rectangles). A distinctive feature of many figured tiles is the effect of "overfusion" and "multicolor", which makes it possible to create very refined and beautiful effects on the roof.

Even after many years, bitumen shingles will retain their presentable appearance, as the granules of bitumen shingles are carefully painted from the inside. The service life of a soft roof is 25-30 years, but it can last much longer with regular and simple care. It is necessary to inspect the roof several times a year and, if necessary, remove debris and fallen leaves from i

Pros: Ease of installation, possibility of use on many types of pitched roofs and roofs of complex configuration, wide color gamut, noiselessness, high thermal insulation, low weight, low percentage of waste, ease of repair and low cost. **Cons:** tendency to the appearance of mold and fungus, as well as the need to use a moisture-resistant stove.

APPLICATION OF HIGH-PERFORMANCE CONCRETE IN BUILDING STRUCTURES AND ANALYSIS OF ITS EFFECTS

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With the advancement of construction technology, high-performance concrete (HPC) has been extensively applied in building engineering due to its excellent mechanical properties, durability, and workability. This paper provides a comprehensive analysis of the composition materials, mix optimization, mechanical properties, and the application of HPC in various building structures. It discusses the effects and advantages of HPC in modern architectural design and construction. Through case studies and comparative experimental data, this paper demonstrates that HPC not only enhances the load-bearing capacity and ductility of building structures but also plays a crucial role in extending their service life, reducing maintenance costs, and improving environmental sustainability. Additionally, the paper explores the challenges and future directions in the application of HPC, offering new perspectives for research in building materials and engineering practices.

Traditional concrete no longer meets the demands of modern construction. High-performance concrete (HPC) has become a critical building material due to its superior strength, durability, and workability. Research on HPC advances building material science and improves construction quality and efficiency.

Definition and Classification: HPC is specially designed for high strength, high durability, and excellent workability through optimized mix proportions. Types include high-strength, high-fluidity, high-durability, and self-compacting concrete.

Constituent Materials: HPC uses high-performance cement, carefully graded aggregates, low water content, high-efficiency water reducers, and mineral admixtures (silica fume, fly ash, slag powder). These mineral admixtures optimize pore structure, enhance compactness, and improve durability and corrosion resistance.

Mix Design Principles: A low water-to-cement ratio and high admixture usage are fundamental. Trial mixes verify performance targets such as strength, workability, and durability.

Bridge Engineering: HPC increases load-bearing capacity and reduces maintenance in critical components like piers and decks. In a sea-crossing bridge case, HPC resisted chloride corrosion, allowed longer prefabricated beams, and reduced on-site work, extending lifespan.

High-Rise Buildings: HPC enables thinner structural components, increasing usable floor space while maintaining strength and stiffness. A skyscraper case showed reduced maintenance costs and extended building life, promoting sustainable development.

Seismic Structures: HPC enhances ductility and energy absorption in frames, walls, and joints. It allows optimized reinforcement detailing (reduced congestion) and performs better in simulated earthquake tests, improving seismic resilience.

- Compressive strength is 40–60% higher than ordinary concrete, allowing smaller member sizes and higher safety margins.

- Flexural performance shows better crack resistance due to strong aggregate-paste bond.

- Ductility and toughness are enhanced with fiber reinforcement (steel or polypropylene), enabling energy dissipation during earthquakes.

- Long-term stability under sustained loads is ensured by low w/c ratio and mineral admixtures, reducing creep and maintaining strength despite environmental fluctuations.

Durability Performance:

- Permeability and chemical resistance: Dense microstructure blocks moisture, chlorides, and sulfates, preventing reinforcement corrosion. Suitable for chemical plants and wastewater facilities.

- Freeze-thaw resistance: Low porosity and air-entraining agents create microbubbles that relieve internal pressure, preventing damage.

- Abrasion resistance: High-strength mineral admixtures and fibers increase surface hardness and suppress micro-cracks.

- Environmental factors: HPC withstands salt spray (chloride resistance) and acid rain (sulfate/carbonate resistance) through material selection and protective coatings.

Economic and Environmental Sustainability:

- Cost-benefit: Higher initial cost is offset by reduced material usage (smaller sections), shorter construction time (self-compaction), and much lower long-term maintenance.

- Environmental impact: Use of fly ash and silica fume (industrial by-products) reduces cement demand and CO_2 emissions. Efficient construction lowers energy use and waste. Longevity reduces need for new materials.

- Green building contribution: HPC improves LEED/BREEAM ratings, reduces building carbon footprint, and supports circular economy through recyclability.

HPC significantly enhances structural mechanical performance, durability, and economic benefits while positively impacting environmental sustainability. Despite challenges in construction technology and cost control, continuous

innovation promises broad future applications. This study provides theoretical support and practical guidance for HPC development and use.

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URBANISM: CREATING BETTER CITIES THROUGH THOUGHTFUL DESIGN AND INNOVATION

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Ukrainian cities have changed a lot for the better in almost 35 years of Independence from the Soviet Union. Our cities are like the hearts of our country, which help it to live, but simply building chaotically and doing nothing will not help cities and our country to live further, especially in such a difficult moment as now, and one of the tools to help our cities is Urbanism.

First, there is a need to understand what "Urbanism" is. Urbanism is the scientific study of how inhabitants of urban areas, such as towns and cities, interact with the built environment. It is a direct component of disciplines such as urban planning, a profession focusing on the design and management of urban areas and urban sociology, as well as an academic field, which studies urban life.

Urbanism is an integral part of improving, planning and developing our cities, but without experience we will not be able to do this, so looking back at our European colleagues, we can draw conclusions and make our cities more European.

For example, “New European Bauhaus”. New European Bauhaus (NEB) is a policy and funding initiative that makes green transition in built environments and beyond enjoyable, attractive and convenient for all. Even the smallest communities on the ground deserve living spaces that improve their well-being and sense of belonging. The initiative promotes solutions that are not only sustainable, but also inclusive and beautiful, while respecting the diversity of places, traditions, and cultures in Europe and beyond.

Fig. 1. One of the "New European Bauhaus" Projects

Another important aspect of modern urbanism is sustainability. Cities must not only grow, but also do so responsibly, minimizing harm to the environment. This includes the development of green zones, parks, and pedestrian-friendly streets, as well as reducing air pollution and improving public transportation. A well-designed city encourages people to walk, cycle, and use public transit instead of relying heavily on cars.

Another example of good urbanism is in Paris and these are pedestrian-friendly tram stops. They are modern, accessible, and brightly lit, typically featuring open-air platforms, glass shelters, and digital, real-time arrival displays. They are usually located in the median of the street or along designated tracks, designed with easy boarding for passengers using Citadis-type vehicles.

Fig. 2. Tram stops in Paris (1)

Fig. 3. Tram stops in Paris (2)

For Ukraine, especially in the context of current challenges and future reconstruction, urbanism becomes even more important. Rebuilding cities is not just about restoring what was lost, but about creating better, more resilient and more comfortable environments for people. This is an opportunity to rethink urban spaces and implement modern European principles.

One of the greatest examples of modern urbanism in Ukraine is Uspenska Square in Dnipro. It is one of the oldest squares in the city, with a history of more than 200 years, which for a long time had lost its meaning and turned into just a transit zone. However, after reconstruction completed in 2023, the square became a modern public space focused on people, not cars.

Fig. 4. Uspenska Square in Dnipro

At the same time, urban transformation in Ukraine is supported not only by architects and city planners, but also by national initiatives. The programs of the First Lady of Ukraine Olena Zelenska play an important role. Her foundation implements projects aimed at improving social infrastructure, especially in the context of war.

One of the key directions is the creation of safe, inclusive, and modern spaces for people. For example, the foundation works on rebuilding and equipping shelters in schools, turning them into safe and functional environments that can also serve as community spaces in the future.

Another important initiative is the development of medical and rehabilitation infrastructure, such as the Superhumans Center in Dnipro. This project provides modern rehabilitation, prosthetics, and psychological support, helping people return to active life.

These initiatives show that modern urbanism in Ukraine is not only about aesthetics or planning, but also about humanity, resilience, and care for people. Together with successful projects like Uspenska Square, they form a new vision of Ukrainian cities: - cities that are inclusive, sustainable, and focused on human well-being. Because cities are people's homes, and people should love them even when they are not perfect.

City is a place of the constant dialogue, which often, due to its impossibility, turns into conflict.

INFORMATION TECHNOLOGIES AND DIGITALIZATION PROCESSES

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Introduction. The rapid development of information technology has significantly transformed the civil engineering industry, particularly in the design, analysis and construction of steel structures. Digitalization processes allow engineers to improve accuracy, efficiency and reliability throughout the entire life cycle of construction projects [5].

One of the key components of the digital transformation in construction is Building Information Modeling (BIM) [1]. BIM allows the creation of intelligent 3D models that integrate structural, architectural and engineering data. In steel construction, BIM technologies contribute to the accurate modeling of connections, optimization of material use and detection of clashes at the early stages of design. This reduces the risk of errors during fabrication and installation [3].

Another important aspect is the use of computer-aided design (CAD) and structural analysis software, such as Tekla Structures, AutoCAD and SAP2000. These tools allow engineers to perform complex calculations, simulate loads and evaluate the behavior of structures under different conditions. This is especially important for steel structures due to their sensitivity to bending, dynamic loads and joint design [3].

Digital manufacturing technologies also play a crucial role. CNC machines, robotic welding systems and automated cutting processes ensure high-precision manufacturing of steel elements. Integrating digital models with manufacturing systems minimizes human error and increases productivity [4].

In addition, cloud technologies and data management systems improve collaboration between project participants [1]. Engineers, architects and contractors can work on shared models simultaneously, ensuring better coordination and faster decision-making. This is especially important in large-scale projects involving steel frames [6].

The introduction of digital twins represents a new phase in digitalization. A digital twin is a virtual representation of a real structure that allows its condition to be monitored in real time [5]. Sensors installed in steel structures provide data on stresses, deformations and environmental influences. This enables predictive maintenance and increases the safety and durability of buildings [2].

Despite the benefits, digitalization also poses challenges. These include the need for specialized training, the high cost of software, and data security issues.

However, the long-term benefits, such as reduced construction costs, improved quality, and increased safety, outweigh these limitations [3].

In conclusion, information technology and digitalization are becoming essential elements of modern engineering practice. Their application in steel structures significantly improves design accuracy, construction efficiency, and operational reliability. Future developments in artificial intelligence and automation will further empower engineers and transform the construction industry [6].

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UKRAINIAN BUILDING AND ARCHITECTURE IN THE 17TH CENTURY: HISTORICAL ANALYSIS

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Architecture and construction of the 17th century. The second half of the 16th - the first half of the 17th century became a qualitatively new stage in the development of architecture and urban planning in Ukrainian lands. It was during this period that new artistic trends associated with the activities of European builders, mainly Italians, most clearly manifested themselves. They gave the local brick architecture features of the late Renaissance, in particular its northern Italian variant. The remains of Gothic gradually disappear, and at the beginning of the 17th century, the first buildings of the Baroque style appear. New European principles also spread in urban planning and defensive architecture.

An important role in these processes was played by Italian masters who worked in Lviv and other cities. Among them were Peter the Italian, Paul of Rome, Christopher Bozzano, Jacopo Madlena and others. They often arrived through

Krakow and worked in the service of magnates, in particular Prince Konstantin of Ostrog. Their activities contributed to the spread of new architectural forms and techniques.

New principles of urban planning began to be actively implemented from the beginning of the 17th century. An example is Sharhorod, as well as Zhovkva - a well-preserved city with a market square, castle and church. In the first half of the 17th century, Brody was replanned according to new European principles - a city with a regular pentagonal shape, probably designed by engineer Guillaume de Beauplan. Similar changes took place in the city of Bar.

At the same time, a significant part of the cities retained their traditional layout. Old cities were actively developing, receiving new fortifications. For example, in Kamianets-Podilskyi the fortifications were modernized; in Ostroh, new gates and the Round Tower were built. In Lviv, the fortifications were restored: in particular, the Powder Tower and the City Arsenal were built, and later - the Royal Arsenal, in the Baroque style.

In the 17th century, fortified castles were actively built. Frequently, this was a reconstruction of old fortresses, as in Ostroh, Dubno or Starokostyantyniv. Among the new castles, the Senyavskyi residence in Berezhany and the castle in Zhovkva stand out. Numerous fortifications appeared in Podillia and Pokuttya (in Zolotyi Potok, Skalat, Kryvcha and other cities).

At this time, a new bastion system of fortifications, borrowed from Western Europe, was spreading. It involved the use of earthen ramparts and bastions. An example is the castle in Zbarazh (1626–1631), designed with the participation of Vincenzo Scamozzi, as well as fortifications in Bar and Kodak. Similar principles were applied in Zolochiv and Brody. A special example is the palace in Pidhirtsi, which combines defensive and palace functions.

Wooden construction was preserved in Kyiv Region and the Left Bank. Castles, fortifications and monasteries were wooden. Monastery complexes were of a defensive nature and consisted of walls, towers and residential buildings. Since the beginning of the 17th century, Catholic defensive monasteries have been actively built: - in Lviv, Sokal, Izyaslav, Vinnytsia, Pidkamen and Mezhyrich. They combined religious and defensive functions and reflected European architectural traditions.

Secular construction has developed significantly, especially in Lviv. The center of the city was the Market Square with the town hall and numerous tenement houses. The most famous is the Kornyakta tenement house with an inner garden and arcaded galleries - an example of Italian influence. The houses of Bandinelli, Massari, Sholtsiv and Dybovytskyi also stand out. Outside Lviv, individual examples of residential and public architecture have been preserved: - town halls in Sambir and Kamianets-Podilskyi, houses in Zhovkva and Lutsk.

Fig. 1. Sharhorod. Church of St. Florian (16th–17th centuries)

Fig. 2. Brody. Remains of the Bastion Fortress

In church architecture, masonry buildings prevailed, although there were few of them. In Lviv, the construction of the Assumption Church continued, and the Pyatnytsky Church was also rebuilt. In other regions, the Annunciation Church in Gorodok, Yuriivska in Brody, and Mykolaivska in Zolochiv are known. In Volyn, the Mykolaivska Church in Okhlopiv and Mykhailivska in Hoscha were built, which reflect the influence of the wooden tradition. In Lutsk, the Church of the Exaltation of the Holy Cross stands out.

Thus, in the 17th century, the architecture of Ukrainian lands developed under the influence of European styles, combining Renaissance, Baroque and traditional elements. This was a period of active construction of cities, castles, temples and fortifications, which formed the unique architectural face of Ukraine.

MODERN THEATRE ART OF UKRAINE: COMMUNICATIVE ASPECTS

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Theatre art in modern communicative space in Ukraine is important, original and independent part of artistic communication. It develops according to special artistic paradigms. It is through Melpomene`s art with its special metaphorical language that mutual understanding in society, harmonization of the human personality is possible.

The nature of theatre art is usually studied through different scientific approaches which show its interdisciplinary character: cultural, philosophical, aesthetic, psychological, sociological, semiological, and others. Each approach helps to explain the nature, essence, and functioning of theatre in its own way. Theatre as a special type of artistic creativity requires a systematic approach.

Nowadays, it is important to study theatre while considering feedback between the author, director, actor, and audience.

The cultural and communicative approach to theater studies is natural because the stage represents a model of a certain culture and demonstrates a cultural code. This is especially important for presenting modern Ukrainian theatre in the international cultural space and intercultural communication. Media presentation of theatre art in Ukrainian print and audiovisual mass media can also take place in cultural coordinates. This is logical because theatre journalism records the process of artistic communication.

The German theater theorist Christopher Balme describes contemporary theatre as an "artistic media". Theatre is created and exists in the communicative interaction between the actor and the audience. The viewer, reader, or listener is also a part of this process. An important research question is how a theatre performance relates to audience perception.

Theatre art as a special type of artistic communication can also be studied through Jürgen Habermas's theory of communicative action. According to the philosopher, a person must understand what they see, and understanding is only possible through participation. This idea is important for a theatre critic, who acts as a partner, interviewer, listener, and spectator. Communicative structures help people understand the "life world". Understanding is not limited only to language, and the goal of communication exists beyond speech. Communicative action is directed both toward communication and negotiation. Understanding appears when a reader receives a media message and reacts to it by visiting the theatre or refusing to attend a performance. A critic or journalist should form the audience`s aesthetic need for theatre.

These days theatre art can be understood as a semiological system. The sign nature of theatre was studied by Jan Mukařovský in his work The Aesthetics of Dramatic Art. The semiotician Roland Bartens considers theatre an informational and polyphonic art form. This method corresponds with the symbolic nature of theatre and helps explain the decoding of stage symbols into the verbal and visual language pf theatre journalism.

Theatre art is synthetic by its nature. Theatre performances are intermedial because they combine instruments from different types of art. They also use achievements from many sciences and technical fields. For example, psychological research became an important basis for acting and directing, as well as studies in semiotics, history, sociology, and physiology.

The basis of a theatre performance is a drama, which defines the artistic possibilities and ideological direction of theatre. Theatre transforms a literature text into stage action and theatrical imagery. In some situations, speech shows the everyday characteristics of a character. In other cases, it reveals psychological

conflicts and the inner world of the hero. Stage speech can appear in the form of a monologue, dialogue, direct address to the audience, or inner monologue.

The main carrier of theatrical action is the actor. The actor`s creativity reflects the essence of theatre: the ability to involve the audience in a live artistic performance. The actor creates the role on the basis of the play and the director`s interpretation. However, the actor remains an independent artist who can create a realistic human image on stage and present complexity of human psychology.

The distinctive feature of theatre art is its uniqueness in time: every performance exists only during the moment of presentation. The language of theatre is understandable for audiences on different continents and for people with different social, cultural, and educational backgrounds. The democratic character, openness, and high interactivity of modern theatre make it a powerful instrumental for forming moral and ethical values and for supporting the harmonious development of personality during the period of a global challenge.

3D VISUALIZATION IN ARCHITECTURE

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3D visualization in architecture (also called 'Archvis') is a three-dimensional image of the exterior or interior of a building made on computer. This image allows you to accurately and realistically demonstrate a designed house or an apartment project. This way, 3D architectural visualizations provide a full understanding of form, lighting, materials, and atmosphere before it is created in practice.

Archvis is widely used by architects, designers, urban planners, construction companies and real estate agents to present projects to clients with the aim of advertising services, preparing for tenders and visually illustrating the expected result of the work to contractors. However, architectural visualization is usually done by 3D artists, who are contacted by the architect and companies. Furthermore, lawyers often order visualization for accident scene reconstruction. In addition, 3D models help judges and juries better understand the situation and make fair decisions. In summary, Archvis is used in various fields of specialization to demonstrate a realistic image of a location or building.

Becoming a 3D artist requires to master specialized programs and engines for 3D modeling and rendering; for this reason, you must have access to render post-processing tools. A 3D artist also needs to be knowledgeable in architectural styles, have an idea of ergonomics in design, know the rules of composition, and

be able to read architectural drawings. Formal education is a plus but not a requirement. The key for a 3D artist is practice and portfolio.

There are many special graphic editors and render engines for creating architectural 3D visualization that are used. The most popular tools are 3Ds max, V-Ray, Adobe Substance 3D, Revit and Photoshop for final processing. To create Archvis we have some important stages for high quality image. There are several key stages. Firstly, gathering source data as drawings, plans, references and technical documentation which were made before this. Secondly, building the geometry of the structure or interior using software. Then, assigning realistic materials such as brick, concrete, glass, wood, etc. Proper texture setup is key to photorealism and better understanding of structure. The fourth stage is to adjust natural lighting such as sunlight, and artificial lighting such as lamps and chandeliers, taking into account the time of day and weather conditions. And the last thing - rendering and post-processing that include color correction, detail enhancement, and contrast improvements.

The main advantage of Archvis is improved communication between the developer and the customer. Architectural visuals help avoid misunderstandings between the architect and the client and reach an agreement regarding the appearance and materials of the future building. Consequently, it helps to save time and prevents unnecessary expenses. In addition to this, the client values the project more when they can examine it clearly and this attracts more new clients.

In conclusion, Archivis is widely used these days as a communication and demonstration tool to improve understanding between the client and the developer, as well as for other purposes, such as accurately depicting a location. In the age of digital technology, we have more opportunities to simplify work by reducing potential misunderstandings and defects in the finished product.

MAIN FACTORS FOR WALL MATERIALS: HEAT, STRENGTH, AND ENVIRONMENT

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When building walls, it is important to choose the right material. It must be strong, keep heat well, be inexpensive, and if possible safe for the environment.

To determine the best material, I suggest highlighting: aerated concrete, shell rock, and cinder blocks. These materials are often used in the construction of small houses, but each has its own features.

Aerated concrete is a light porous material that appeared in construction relatively recently, but quickly became popular. Its density is 300–800 kg/m^3, and

its thermal conductivity is 0.34 W/(m·K). In addition, aerated concrete keeps heat very well. However, the strength of aerated concrete is low: - about 2–5 MPa. It is not suitable for heavy structures and requires protection from moisture. When building walls, it is important to use a special adhesive. Aerated concrete is easy to process, which allows creating complex shapes without any problem.

Fig. 1. Aerated Concrete

Shell rock is a natural stone obtained from marine remains. The density of shell rock is about 2,300 kg/m³, and its thermal conductivity is 0.20–0.50 W/(m·K). It does not hold heat as well as aerated concrete, but it is stronger (5–15 MPa) and completely eco-friendly. Shell rock helps maintain a comfortable indoor climate: the walls "breathe" and retain moisture, preventing dampness. However, building with shell rock requires care: the blocks need to be selected for size, and the gaps - carefully filled with mortar. However, such a house turns out reliable and long lasting, and the natural stone makes the appearance of the house unique.

Fig. 2. Shell Rock

Cinder block is an artificial material. Its density is about 1,000–2,000 kg/m³; its strength reaches 5–20 MPa, and its thermal conductivity is 0.30–0.70 W/(m·K). It is the strongest of the three materials and at the same time relatively inexpensive. Cinder blocks are widely used for building walls and partitions. They are easy to install, and the large size of the blocks allows walls to be built quite quickly. However, their heat insulation is worse, so additional insulation is needed. Also, cinder blocks are less eco-friendly than natural materials, but for economical construction they remain a popular choice.

Fig. 3. Cinder Block

Each material has its advantages and disadvantages. Aerated concrete keeps heat well, so it is suitable if comfort in cold weather and energy saving are important. However, it has relatively low strength, can absorb moisture, and requires additional protection and finishing. Shell rock is a natural and eco-friendly material that

creates a pleasant indoor climate. At the same time, it is quite fragile, may have uneven density, and also needs protection from moisture and external influences. Cinder blocks combine strength and low price, which makes them convenient for affordable construction. Their disadvantages include lower thermal insulation compared to other materials, as well as possible environmental concerns depending on the composition.

The combination of these factors will help choose the optimal material for a house and make construction convenient and long lasting.

SKILLS MISMATCH BETWEEN EDUCATION AND LABOUR MARKET REQUIREMENTS

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One of the key issues in modern education and labour economics is the mismatch between skills acquired in education and those required by the labour market. Even though more people than ever are receiving higher education, employers in many countries still report a shortage of adequately skilled workers. This phenomenon is known as “skills mismatch”, and it includes situations where graduates are either overqualified or underqualified for available jobs, or when their specialisation does not correspond to job requirements. As a result, this leads to unemployment, underemployment, and inefficiencies in the economy.

Skills mismatch occurs when there is a gap between what education systems provide and what employers need. It can be vertical, when the level of education does not match job requirements, or horizontal, when the field of study does not correspond to the job. This shows that the problem is not only about access to education, but also about its relevance and quality.

One major cause is technological development. Digitalisation and automation have changed labour market needs, but education systems often adapt slowly, resulting in outdated programs. Another important reason is the lack of cooperation between universities and employers. Many academic programs focus on theory, while employers expect practical, job-ready skills. A third factor is the student's choice of specialisation. Many students choose popular fields like business or law, even if the labour market is already saturated, while technical fields often face shortages. Also, traditional teaching methods contribute to the problem, as they focus more on theory than practical skills such as communication, problem-solving, and digital literacy.

Skills mismatch leads to several negative outcomes. For individuals, it often results in unemployment or underemployment, where graduates work in jobs that do not match their qualifications. It also causes wage inequality, as matched workers earn more than those in mismatched positions. From an economic perspective, it reduces productivity and leads to inefficient use of human capital. In the long term, it can also reduce trust in education systems and increase migration of skilled workers to countries with better opportunities.

One key solution is improving cooperation between educational institutions and employers through internships and practical training programs. Another important step is updating curricula to include modern skills such as digital literacy, critical thinking, and communication. Better career guidance can help students choose fields that match labour market demand more effectively. Governments should also support labour market development and new job creation, especially in growing industries. Finally, lifelong learning is essential, as workers need to constantly update their skills due to fast technological changes.

Skills mismatch is a significant problem in modern economies caused by rapid technological change, weak links between education and employers, and poor alignment of student choices with market demand. Its consequences include unemployment, lower productivity, and inequality. However, it can be reduced through stronger cooperation between education and business, modernisation of curricula, better career guidance, and continuous learning.

TRANSLATING CULTURAL IDENTITY: CHALLENGES OF RENDERING "OTHERNESS" ACROSS LANGUAGES

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In contemporary translation studies, the challenge of rendering cultural identity across languages has become increasingly important, especially in works that reflect multicultural, postcolonial, and transcultural experience. In this context, the translator functions not only as a linguistic intermediary but also as an active mediator of cultural meanings, helping to convey complex identity constructs across cultural systems.

To ensure a high-quality translation of any foreign text, the translator must convey key meanings, retain cultural specificity, and at the same time ensure readability and ease of comprehension for the target audience (Fig. 1).

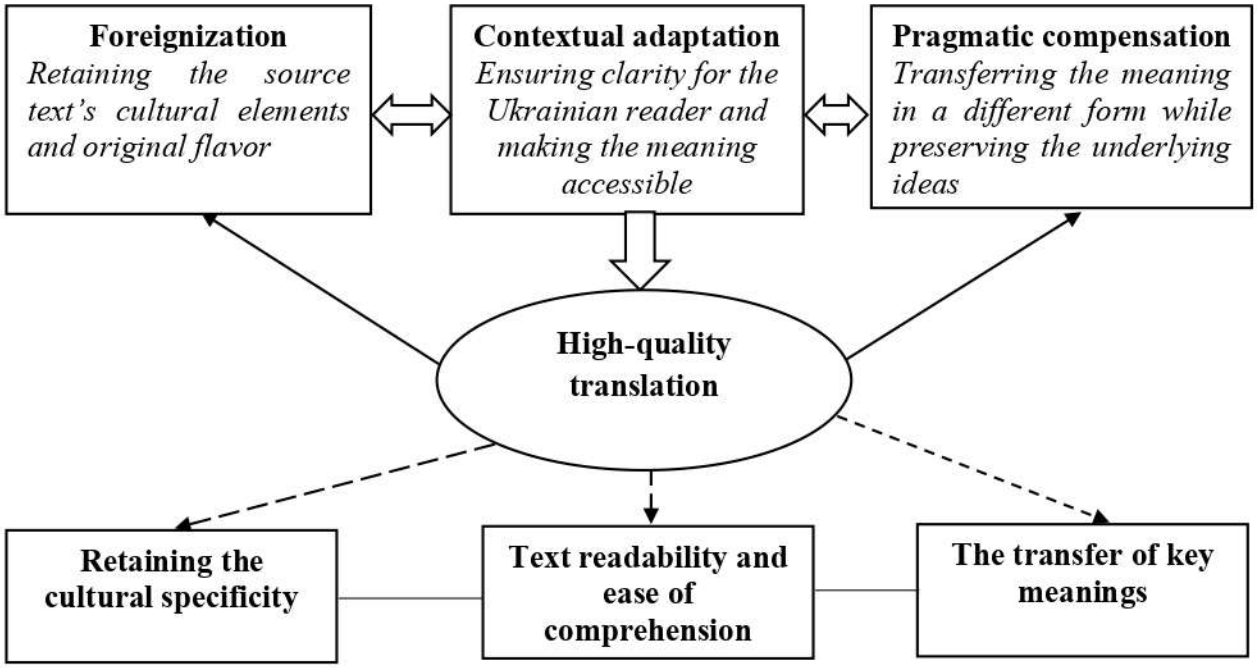

Fig. 1. The translator's steps in producing a high-quality translation

In this sense, it is appropriate to consider the combination of several translation strategies. First, foreignization preserves culture-specific elements and maintains the sense of a foreign cultural space. Second, contextual adaptation plays an important role, as the translator selects linguistic means that make the text accessible to the Ukrainian reader without removing cultural specificity. Third, pragmatic compensation is used when certain meanings cannot be conveyed at one level of the text and are reproduced elsewhere. Each of these strategies has its own advantages and disadvantages. For example, foreignization allows the reader to engage more deeply with the original cultural environment and helps preserve culture-specific realia, terms, and proper names. However, when used in its "pure" form, this strategy may also create difficulties for the reader, as the text can become overloaded with unfamiliar elements. This may lead to problems in comprehension, especially if cultural elements are left without explanation, which can result in misunderstandings of metaphors, humor, or culturally specific practices.

Thus, the main challenge for the translator is to find a balance between these strategies. The success of translation largely depends on the translator's professional competence, which goes beyond linguistic skills and includes knowledge of culture, traditions, and other relevant fields.

These challenges are particularly evident in the translation of novels that depict complex interactions among diverse ethnic, religious, social, and linguistic communities. Such texts are rich in markers of cultural otherness, including culture-specific items, ethnocultural vocabulary, elements of family memory, religious allusions, linguistic hybridity, slang, and sociolects. Special attention

should be paid to the representation of hybrid identities, which are one of the key features of such texts. In translation, this requires preserving the polyphony of voices, the stylistic complexity of the text, and its cultural ambivalence. Here, the translator acts as a mediator of otherness, whose task is not to eliminate differences but to preserve the effect of cultural heterogeneity. This, in turn, requires a balance between the stylistic distinctiveness of the original and the conventions of Ukrainian literary prose.

Thus, translating cultural identity involves a range of challenges related to rendering "otherness" across languages. Translation decisions shape the reception of a multicultural text within another linguistic community and influence the preservation of its cultural specificity. In this process, the translator acts as a mediator between cultural memory, linguistic self-identification, and social experience. Literary translation of multicultural texts is therefore not merely a process of linguistic substitution but a complex interpretative activity at the intersection of languages, cultures, and identities.

НАУКОВЕ ВИДАННЯ

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