Analysis of global visual practices in the development of game projects

Oleksandr Kohutiak*

Postgraduate Student
Vasyl Stefanyk Precarpathian National University
76018, 57 Shevchenko Str., Ivano-Frankivsk, Ukraine
https://orcid.org/0009-0003-5659-2500

Nadiia Babii

Doctor of Arts, Professor
Vasyl Stefanyk Precarpathian National University
76018, 57 Shevchenko Str., Ivano-Frankivsk, Ukraine
https://orcid.org/0000-0002-9572-791X

Abstract. The relevance of the study is conditioned by the growing influence of visual practices on the development of aesthetics, narrative and user experience in video games, which makes them one of the key factors in the development of the global gaming industry. The purpose of the study was to analyse the leading visualisation trends that determine the artistic and technological features of game worlds of the last decade. The study was based on a comparative, and system and analytical approach, and included content analysis of games, interpretation of their visual design, and review of scientific sources. In total, 23 game projects of various genres and styles were analysed, which allowed identifying patterns in the development of the visual component of the industry and tracing the relationship between aesthetic solutions, technological innovations and commercial success. The sample included both high-budget AAA projects and independent indie games, which provided a more comprehensive vision of contemporary approaches to design. The analysis showed that current practices cover stylised graphics, cel-shading, pixel art, sumi-e and the latest solutions based on artificial intelligence, including procedural art and generative stylisation. It was revealed that an important role is played by the design of the user interface and user experience, which determines the intuitiveness and convenience of interaction, and "environmental storytelling" as a form of wordless narrative that deepens the emotional connection of the user with the game world. Special attention was paid to the use of cinematic techniques and interactive directing, which provide a hybrid gaming experience and bring video games closer to other forms of audiovisual art. The results of the study can be used by game designers, artists, educators, and digital media researchers as an analytical base for developing visually holistic and commercially successful games, and in the field of educational design, cultural analytics, and creating an inclusive visual environment

Keywords: stylisation; procedural graphics; UI design; cinematography; adaptability; game design; narrative

🗨 INTRODUCTION

In the current conditions of globalisation, digital culture played a key role in the development of new forms of visual communication, among which video games occupied a special place. They were no longer limited to just entertainment, but turned into powerful tools for storytelling, art, and social dialogue. In this context, visual practices became particularly important, since it was through them that the atmosphere, identity, and content of the game were transmitted.

The relevance of the study was determined by the rapid development of the gaming industry, the integration of the latest technologies, such as artificial intelligence and virtual reality, and the growing expectations of users regarding the quality of visual content. The analysis of contemporary world visual practices allowed developers to create competitive, deeply aesthetic, and functional projects that met the challenges of the time.

Researchers have increasingly focused on the versatility and cultural significance of video games. Thus, N.P. Babii (2020) viewed modernity as a period of accelerated variability in aesthetic paradigms, in which modernity, postmodernism, hypermodernism, and metamodernism co-existed in a complex configuration. This confirmed that game projects were becoming part of a broader cultural field and forming new visual forms of artistic experience. M. Okur *et al.* (2024) focused on the art of graphic design in video games, analysing the transformation of styles from realism to stylised trends. The researchers argued that such changes directly affected the player's narrative, atmosphere, and level of emotional immersion. The study showed that the aesthetic solution was of key importance for the perception of the game, because it was the visual image that determined the nature of the user's interaction with the game environment. Similar conclusions were made by Z. Wu & M. Oktrova (2024), who found that virtual reality technologies can significantly enhance the emotional perception of artistic content, forming deeper immersion and new ways to interpret contemporary visual experiences.

N.A. Bracikowska (2021) explored the practice of environmental storytelling, which involved building a narrative through spatial and visual elements of the environment. The researcher proved that the location of objects, their composition and architectural connections served as carriers of history and content. This showed that the player gained access to the narrative not only through text or dialogues, but also through visual analysis of space. E. Ioannou & S. Maddock (2023) considered the possibilities of using neural networks for AI graphics styling. Using Neural Style Transfer Technology, the researchers demonstrated that a visual scene can adapt to a specific artistic aesthetic in real time without significantly losing performance. This opened up new perspectives for creating unique artistic styles within a single project, expanding the individual perception of each user.

In the same year, K. Fukaya *et al.* (2023) proposed a conceptual framework for intelligent generation of graphical assets. The researcher systematised approaches to the use of artificial intelligence in creating visual content and outlined problems related to quality control and preserving artistic integrity. This emphasised that the role of AI technologies went beyond instrumental support and became part of the creative process. E.J. Pretty *et al.* (2024) studied UI (User Interface) and UX (User Experience) design in the context of player cognitive load. They compared objective and subjective interaction indicators and proposed new approaches to developing interfaces based on multimodal feedback. This study confirmed that effective user interface design had a direct impact on the comfort and gameplay performance. H. Engström (2020) emphasised that creating video games was an interdisciplinary practice that combined programming, design, visual arts, sound, scripting, and interface development. According to the researcher, game projects were not only technical products, but also complex cultural and technical phenomena that formed a new form of digital communication and aesthetic experience. This approach confirmed that the analysis of visual practices in video games required considering a broader cultural and interdisciplinary context.

Thus, the generalisation of contemporary scientific developments showed that visual practices in video games performed not only aesthetic, but also communicative, narrative, and cognitive functions. They determined the nature of the user's interaction with the game environment, influenced the degree of immersion and ensured the development of new cultural meanings. The purpose of the study was to analyse research that highlighted the impact of world visual practices on game projects.

MATERIALS AND METHODS

In the course of the study, a set of methods of scientific cognition was applied, which provided a holistic study of visual practices in contemporary video games. The main ones were: the method of comparative analysis, content analysis, case studies, and the system and structural approach. The use of these methods was determined by the versatility of the subject of research, which combines technological, aesthetic, and cultural components. Comparative analysis was used to identify differences and common features between different visual design styles (photorealism, stylised solutions, cel-shading, pixel art, sumi-e, low-poly, etc.). This allowed tracing trends in the choice of artistic strategy by developers and determining which approaches are most often used in contemporary projects. Content analysis of scientific sources helped to systematise existing approaches to the study of graphic style, UI/UX design, procedural art, and AI stylisation. This created a theoretical basis for further analysis of practical cases. The case study was used for an in-depth review of specific games as examples of successful implementation of visual strategies. This allowed tracing the relationship between the choice of artistic style and the effect of immersing the player in the world of the game. The system and structural approach allowed considering visual practices not in isolation, but as an interconnected system, where graphics, UI/UX, environmental storytelling, and cinematography form a single complex.

The study was carried out in stages:

1. The theoretical stage consisted of the collection and processing of literary and scientific sources that covered the problems of visual practices.

2. Analytical stage – systematisation of scientific approaches, determination of the main areas (graphic style, AI stylisation, procedural art, UI/UX,

environmental storytelling, cinematic presentation, cross-platform).

3. The practical stage – selection of games as objects of research, analysis and comparison of their visual features. The choice of projects was based on chronological, technological and stylistic criteria (relevance, use of innovative rendering technologies, procedural generation, artificial intelligence, visual effects or interface solutions, and compliance with a clearly formed artistic style that reflects the author's vision of the developers and corresponds to the aesthetic concept of the game).

4. The generalising stage – development of conclusions about the role of visual practices in contemporary video games, their impact on narrative, cognitive perception, and cultural significance.

As part of the methodological analysis, 23 game projects were selected as a source of reference material, representing key stylistic and technological solutions in contemporary game design. Borderlands, Genshin Impact, and The Legend of Zelda: Wind Waker were used to study cel-shading aesthetics, while Celeste and Undertale were used to analyse pixel art. Examples of traditional artistic style were Ōkami (sumi-e) and Gris (watercolour). Spatial isometry in combination with cartoon visual is considered on the example of League of Legends, while generative graphics (procedural art) are based on No Man's Sky. Some aspects of user interaction with the interface were studied using the example of Dead Space and Ghost of Tsushima; the principles of visual narrative were studied using The Last of Us, The Last of Us Part 2, What Remains of Edith Finch, Dark Souls, and Bloodborne. Motion capture technologies were analysed through Detroit: Become Human, Uncharted 4, and Hellblade: Senua's Sacrifice; VR design – based on Half-Life: Alyx; AR mechanics – in Pokémon Go, and The Witcher: Monster Slayer; inclusive design principles – based on God of War: Ragnarök. The study was based on scientific papers and official information sites and developer blogs: the official No Man's Sky blog (n.d.), the Unreal Engine site (n.d.) (Lumen and Nanite technologies), Valve Developer Community (n.d.) (Half-Life: Alyx), miHoYo Dev Notes (Genshin Impact) (HoYoLAB, n.d.). These sources helped to clarify the technical aspects of the visual practices used and confirm the accuracy of the information.

The use of these methods and materials allowed comprehensively analysing contemporary visual practices in video games. The analysis covered both stylistic characteristics of graphics and semantic aspects of the visual series considering the genre specifics and target audience of each project. The research methodology was designed in such a way that any researcher can repeat it using the same sources, analysis methods, and a list of game examples. This ensured not only scientific reproducibility of the results, but also created the basis for further comparative research in the field of game design, digital art, and visual communication.

RESULTS AND DISCUSSION

The graphic style of video games is one of the key consequences of the resonance of contemporary visual practices. It forms the visual language of the project, its atmosphere and aesthetic expressiveness. This is not just about appearance – it is an artistic choice that influences the perception of the plot, characters, and the entire game world. Contemporary developers are increasingly choosing stylised solutions that allow creating a unique identity of the game, working with symbolism and emotions, rather than photorealism. One of the most popular practical tools is cel-shading, an effect of animation or comics on 3D models that creates a unique style, as shown in Figure 1 (Zheng, 2024).
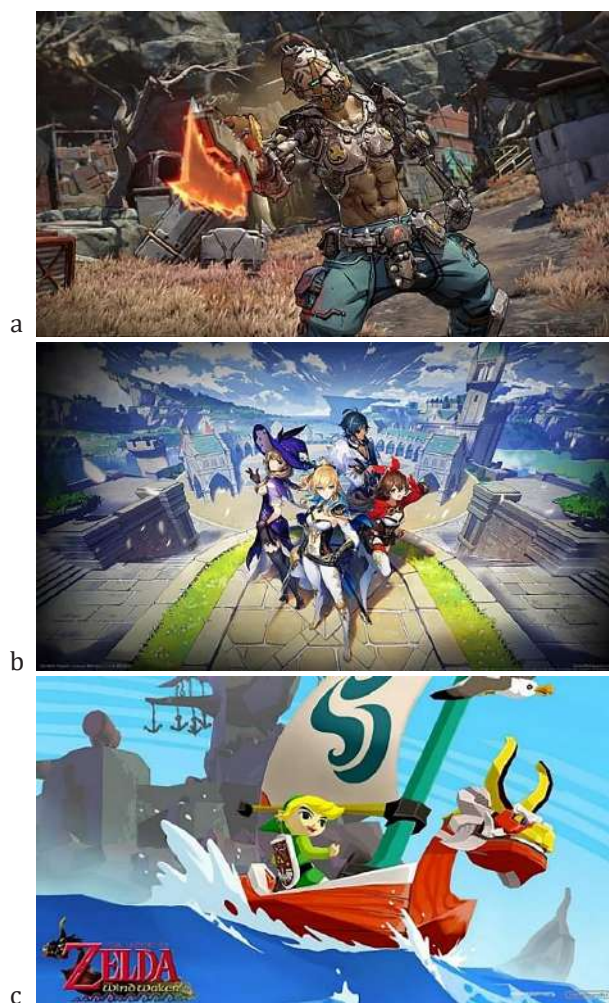

Figure 1. Examples of using cel-shading technology in game projects
Note: a – Borderlands; b – Genshin Impact; c – The Legend of Zelda: Wind Waker
Source: taken from Epic Games (n.d.), Nintendo (n.d.)

Cel-shading uses flat colours and contour lines, such as in Borderlands, Genshin Impact, or The Legend of Zelda: Wind Waker. This style is not only artistically recognisable, but also technically less demanding

on resources, which allows reaching a wider audience of players. Another area is pixel art, which uses the aesthetics of the old 8 and 16bit games, but in the contemporary context. In projects such as Celeste or Undertale, as shown in Figure 2, pixel stylisation becomes a form of visual expression of emotions, memory, and even nostalgia. This is not a technological limitation, but a purposeful artistic choice.

Figure 2. Pixel art of the Celeste game project
Source: taken from Epic Games (n.d.)

The watercolour or sumi-e (n.d.) aesthetics, which can be seen in Ōkami or Gris, mimic traditional painting techniques, turning the game into a visual poem, as shown in Figure 3. In addition, more and more projects are using low-poly, flat-design, and hybrid styles that combine minimalism with visual expressiveness (Kaasinen, 2023). This allows creating original worlds without unduly complicating the graphics.

Figure 3. Sumi-e aesthetics of the Gris project
Source: taken from Valve Corporation (n.d.)

One example of a successful visual style is the game League of Legends by Riot Games. It features stylised fantasy graphics from cartoon aesthetic where the characters have bright colours, exaggerated proportions, and crisp silhouettes. This approach allows visually distinguishing champions during dynamic gameplay, provides recognition, and creates visual consistency in a universe that combines magic, science, mythology, and fantasy. The rejection of photorealism allowed the game's authors to experiment freely with shapes and styles, while maintaining functionality in the visual load. League of Legends graphics

are based on an isometric 2.5D presentation, where 3D models are combined with patterned textures, giving the game the appearance of a stylised illustration. The visual style is constantly evolving: over time, Riot Games has updated the design of maps, redesigned the appearance of champions, improved visual effects, and even created animated cinematic videos in the Pixar style (Fig. 4). This integrated approach to graphics makes League of Legends not only visually appealing, but also makes it a benchmark for visual practice in MOBA games.

Figure 4. Visual style of the League of Legends map
Note: a – design before 2014; b – updated design after 2014
Source: taken from Epic Games (n.d)

Thus, graphic style is a visual strategy that serves the artistic, technological, and even philosophical goals of the game. Its choice shapes the player's unique experience, interaction aesthetics, and cultural value of the digital project. Special attention should be paid to the tendency to use culturally specific styles that reflect the aesthetics of a particular region or historical period. For example, games inspired by Slavic or Japanese mythology often use elements of folk ornaments, calligraphy, or medieval painting to deepen the identity of the world. Such stylistic solutions add depth and authenticity to the game, making its visual language not only recognisable, but also culturally significant. Attempts to create a "visually recognisable language" are increasingly becoming a strategic goal for developers, especially in the competitive environment of the indie market.

Contemporary game projects are increasingly using artificial intelligence (AI) algorithms and procedural content generation (procedural art), which

form a new stage in the visual design of games. These approaches allow automating the creation of unique locations, objects, textures, and even an artistic style, while maintaining the artistic integrity of the project. They play a particularly important role in large and open worlds, where manual modelling of all parts would be extremely resource-intensive. AI stylisation is the application of deep learning to transform visual content in accordance with a specific artistic aesthetic (He, 2024). Models like Neural Style Transfer allow game developers to overlay an artistic style – such as impressionistic or fantasy – on a three-dimensional real-time scene. This opens up new horizons in styling the visual environment that were previously only available manually. On the other hand, procedural art is based on algorithms that create visual elements based on specified parameters and random values. One of the most famous examples is no man's Sky (Fig. 5), where billions of planets with a unique landscape and flora are created procedurally. Such approaches allow achieving deep visual variability without the direct participation of the artist. The official blog of No Man's Sky (n.d.) explains how procedural generation became a central element of the game's design, creating the effect of endless space exploration.

Figure 5. Procedural generation
of No Man's Sky game content
Source: taken from Valve Corporation (n.d.)

In addition, new game engines, such as Unreal Engine 5, combine AI algorithms with procedural generation to automatically illuminate scenes, optimise geometry and detail. Lumen and Nanite technologies (Skorobogatova, 2023; Unreal Engine, n.d.) provide realistic lighting and geometry processing even in stylised scenes. Thus, AI stylisation and procedural art form a new paradigm of visual design in video games. They not only reduce production costs, but also open up wide opportunities for artistic experimentation, giving each project a unique aesthetic. The use of AI in visual design also allows personalising the visual environment depending on the player's choice or behaviour in the game. For example, adaptive stylisation can change the palette, textures, or even atmosphere depending on the character's moral choice or emotional

state. This opens up a new level of interaction with the game world, where the visual language adapts to the user's actions. This approach combines artistic dynamics with technological flexibility, pushing the boundaries of traditional visual practice.

UI/UX design is a fundamental component of visual practice in the gaming industry (Khan *et al.*, 2025). They determine how the player interacts with the game, how comfortable they perceive information, and how quickly they navigate the world of the game. Unlike purely aesthetic graphics elements, UI/UX focuses on functionality, convenience, and emotional comfort. The evolution of game design has shown a shift in emphasis from overloaded interface elements to minimalism, readability, and adaptability (Bergman & Hermansson, 2023). One trend is the "invisible" or contextual HUD (Heads-up Display), as shown in Figure 6, where the interface only appears when it is really needed.
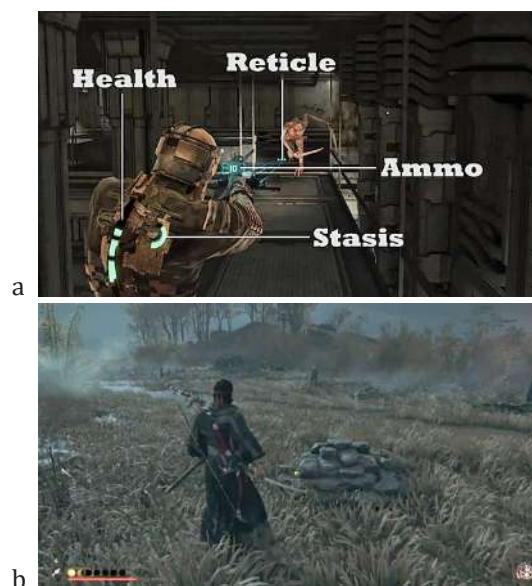

Figure 6. Examples of contextual HUD
Note: a – Dead Space; b – Ghost of Tsushima
Source: taken from Epic Games (n.d.)

For example, in Dead Space, health indicators are integrated into the hero's costume, and in Ghost of Tsushima, the player's path is indicated by the wind, not the arrow on the map. This approach enhances immersion in the game world and removes the barrier between the player and the virtual environment. Another important aspect is the adaptability of interfaces, especially for people with visual, hearing, or motor impairments. Contemporary games, such as The Last of Us Part 2 or God of War: Ragnarök, implement dozens of parameters for customising the interface: font scale, colour filters, text voicing, vibrations for navigation, etc. (Fig. 7). This creates an inclusive visual experience that considers the needs of a wider audience.

Figure 7. Adaptive settings of the God of War:
Ragnarök project
Source: taken from Epic Games (n.d.)

The UX design also covers navigation logic, hints, feedback effects, button animations, and reactions to player actions. A well-designed UX helps the player to learn quickly, increases the enjoyment of the game and reduces "game fatigue". This is especially important in multiplayer games, where reaction speed and user-friendliness can decide the outcome of a battle. Thus, UI/UX design in game projects is a holistic visual and communicative strategy that forms the player's experience, increases accessibility, and is a key component of the aesthetics of a contemporary game. It is also worth noting the role of game research (playtesting) in the development of an effective UI/UX design. It is user feedback that allows optimising the visual elements of the interface – change the colour of the button, the location of the menu, or the structure of hints. UI designers use human psychology to understand how players respond to information loads and visual cues. UX testing has become a mandatory part of development, and the interface has become an active component of audience engagement and retention. Environmental storytelling is a visual practice that conveys the plot, emotions, and mood of a game with space, details, colours, and object placement (Fig. 8) (Stewart, 2015). In this approach, the game world becomes an active narrative agent: through architecture, abandoned objects, lighting, or landscape, the player "reads" the story independently. This method allows forming a deeper dive, encourages interpretation and research.

One of the most striking examples is The Last of Us, where destroyed apartments, abandoned children's toys or abandoned notes give the impression of a "quiet voice of the world", telling about life before the disaster. In What Remains of Edith Finch, family members' rooms are filled with personal items, colours, and shapes that reflect the character of each of them. In Dark Souls or Bloodborne, the history of the world is almost entirely conveyed through architecture, sculpture, symbolism, and the location of objects. This approach has another important advantage-interactive plot disclosure. The player independently creates fragments of information that enhances their emotional connection

with the events of the game. Environmental storytelling is also often combined with visual metaphors: cracks in a building can symbolise the psychological state of the character, the coloyr scheme changes depending on the stage of the story. From a technical standpoint, this practice requires close collaboration between level designers, artists, and screenwriters. Each object in the scene should have a meaning, be "part of the narrative". This technique is especially actively used in indie games, where there are not enough resources for large-scale animation or cinematic inserts, so it is the world that takes on the role of the narrator. Thus, environmental storytelling is a visual language that allows speaking without words. It opens up new approaches to storytelling in video games, making the experience deeper, more personal, and more meaningful. Advanced technologies, such as raytracing, high dynamic range, and virtual lighting, significantly expand the capabilities of environmental storytelling.

Figure 8. Examples of narration through the medium
Note: a – The Last of Us; b – Bloodborne; c – Red Dead Redemption 2
Source: taken from Epic Games (n.d.), Sony Interactive Entertainment (n.d.)

For example, changing the lighting during the game day can not only serve realism, but also symbolise a change in the inner state of the hero or events in the

world. In Red Dead Redemption 2, the evening sun setting below the horizon can carry metaphorical subtext of the end of a journey or loss. Thus, even the "passive" elements of the world acquire a narrative function, and the visual space becomes a full-fledged part of drama.

Contemporary video games are increasingly using cinematic techniques – both visually and structurally. Cinematic animation is a practice in which character movements, camera, editing, and lighting take on the features inherent in films. Combined with drama and acting, this creates a strong emotional effect that brings the game closer to the movie without losing interactivity. The key tool here is motion capture (mocap), a technology that allows recording actors' facial expressions and gestures to accurately transfer the movement to digital animation (Wibowo *et al.*, 2024). This makes characters in games like The Last of Us Part 2 or Detroit: Become Human look compelling and believable. Realistic body animation, small facial reactions, eye contact – all this contributes to the emotional immersion of the player in the story. Another important element is installation and working with the camera. In cinematic games like Uncharted 4 or Hellblade: Senua's Sacrifice, the camera simulates camera art: close-ups, objective offsets, zoom, sudden panoramas, and editing cuts are used. This approach allows directing the player's attention, setting the rhythm of the scene, and enhancing emotional accents. In the case of Hellblade, the camera deliberately moves erratically, imitating the mental state of the main character – this is an example of a deep consistency of technical and artistic design. In addition, game trailers and intros are increasingly reminiscent of high-quality animated films. Riot Games, for example, creates cinematic videos ("Awaken", "The-Call") that not only advertise the game, but also expand its universe through cinematic stories, musical accompaniment, and editing (League of Legends, n.d.).

Interactive cinematic scenes are particularly popular, where the player does not just watch, but interacts with events. Such moments create the illusion of control even in dramatic cutscenes – as in Detroit: Become Human, where the player's choice changes the editing sequence and the outcome of the scene (Fig. 9). This creates a hybrid experience in which the player is both an observer and a director, which gives a unique depth of immersion in the plot.

This technique transforms the concept of "cinematography" in video games, combining the visual language of cinema with the mechanics of interaction (Vargas-Aguilar *et al.*, 2024). With the development of digital technologies and the advent of a large number of devices (PCs, smartphones, tablets, VR helmets, AR glasses), visual practices in gaming projects are increasingly focused on cross-platform and adaptability (Fig. 10). This means that visual content is designed to maintain readability, artistic integrity, and functionality regardless of the platform.

Figure 9. Drama scene from Detroit: Become Human
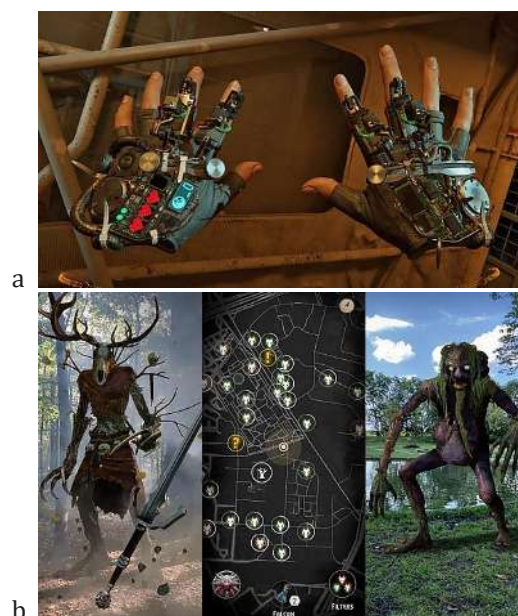**Source:** taken from Epic Games (n.d.)

Figure 10. Cross-platform examples
Note: a – VR technology in Half-Life: Alyx; b – AR technology in The Witcher: Monster Slayer
Source: taken from Valve Corporation (n.d.), Google Play Games (n.d.)

In mobile games, designers often use simplified styling, a limited palette, and large interface elements. An example is League of Legends: Wild Rift, which retained the visual style of the original, but adapted the effects, model sizes, and camera to the mobile format. Other examples are Genshin Impact, which runs simultaneously on PCs, smartphones, and consoles while maintaining a high level of visual quality due to its modular graphics design and automatic texture scaling (HoYoLAB, n.d.). In VRprojects, visual comfort becomes the key: avoiding overexposure, blurring and sudden movements, correct perspective, and light colour. The game Half-Life: Alyx is an example of how the visual adapts to full spatial interaction – objects have depth, and the interface is built into the physical world of the game, for example, in the form of holograms or screens

on the hero's hand (Valve Developer Community, n.d.). ARapplications like Pokémon Go or Tthe Witcher: Monster Slayer create visual content that overlaps with the real world. The visual response to lighting, context, and movement is important here, so dynamic zooming, background blur, and visual cues that don't interfere with the view are used. This requires creating light, expressive models that work against the background of a real environment.

The growing popularity of cloud gaming requires new approaches to visual optimisation. Games broadcast through streaming platforms must adapt not only to devices, but also to the speed of the Internet connection. This indicates the need to dynamically reduce detail or compress textures without losing the overall style. Designers take these conditions into consideration even at the concept stage to ensure visual stability even with minimal technical capabilities. Thus, cross-platform development goes beyond hardware adaptation and turns into a holistic accessibility philosophy. The analysis showed that visual practices in contemporary video games cover a wide range of approaches – from stylised graphics (cel-shading, pixel art, sumi-e) to AI styling and procedural generation. The generalised characteristics of these practices are shown in Table 1, which illustrates their technological features.

Table 1. Overview of visual practices		
Name of technology	**Key features**	**Examples**
Cel-shading	Computer rendering technique that creates the effect of hand-drawn graphics, as in comics or cartoons, using flat colours and sharp transitions between light and shadow, rather than smooth gradients.	Borderlands, Genshin Impact, The Legend of Zelda: Wind Waker.
Pixel-Art	Form of digital art where an image is created or edited at the level of individual pixels (the smallest points) using a bitmap image editor.	Celeste.
Sumi-e	Ancient Japanese technique of monochrome ink painting on rice paper. This art, originating in China, is characterised by the use of a wide range of shades of black ink and water, but sometimes also red.	Gris.
Low-poly, flat-design	Style that uses a small number of polygons (polygons) to create objects, giving them a simplified geometric look with clear edges. Flat design is a minimalist approach that focuses on flat elements without gradients or shadows, creating a two-dimensional interface rather than simulating volume.	League of Legends.
Procedural art	Art created using algorithms, rules, or instructions that automatically generate a visual result. In other words, the artist does not draw each element with his own hands, but sets a certain set of parameters or processes, and a work is born from them.	No Man's Sky.
Invisible Heads-Up Display	Design approach where familiar health panels, items, or a map disappear from the screen, and all information is transmitted through the game world itself or the character's behaviour.	Ghost of Tsushima, Dead Space.
Adaptive interface	Interface that adapts to the user or their conditions to make working with a programme or game more convenient and efficient.	God of War: Ragnarök, The Last of Us Part 2.
Environmental storytelling	Way to present the plot and atmosphere through the game space itself, rather than direct dialogues or cutscenes. That is, the player learns the story by observing the environment.	The Last of Us, What Remains of Edith Finch, Dark Souls, Bloodborne, Red Dead Redemption 2.
Synematic animation	Animation created according to the principles of cinema is as realistic and emotional as possible. In games and multimedia, this term usually refers to animation for cut scenes or moments that are presented with staging, camera work, and cinematic drama.	Detroit: Become Human.
Virtual reality	Technology that creates a complete sense of presence in the digital world for a person using special devices (helmets, glasses, gloves, controllers).	Half-Life: Alyx.
Augmented reality	Technology that overlays virtual objects or information on the real world in real time. That is, the player sees the usual environment around them, but it is "enhanced" by digital elements.	The Witcher: Monster Slayer.

Source: compiled by the authors of the study

The results of the study showed that contemporary visual practices in video games form not only an aesthetic dimension, but also determine the narrative, communication, and cognitive strategies of the player's interaction with the digital environment. The identified trends are generally consistent with the best practices of leading scientists in recent years, although in some aspects they demonstrate new accents. Thus, M. Okur *et al.* (2024) argued that the transition from realism to stylised graphics in the gaming industry opened up opportunities for deeper emotional engagement of the user. The results obtained confirmed this

thesis: examples of cel-shading, pixel art, and sumi-e showed that the rejection of photorealism becomes a conscious artistic strategy. Simultaneously, the cultural significance of such stylisations was also emphasised – in particular, the use of local ornaments and traditional aesthetics. In the paper by M. Okur *et al.*, this aspect was less pronounced, because their emphasis was mainly on the functional and emotional aspects of graphic design.

K. Svensson & W. Bergman (2024), analysing the game Unpacking, showed that environmental storytelling functions not only as a way to "tell without words", but also as a mechanism for forming multi-valued interpretations. The researchers emphasised the importance of the pace, ambiguity, and gradual appearance of objects that create space for the emotional narrative that is born in interaction with the player. In the current study, this position expands: along with the role of space as a carrier of history, it is proposed to consider environmental storytelling as a tool of the metaphorical and symbolic level of storytelling. For example, the colour scheme or destruction of architecture may reflect the psychological state of the character, and the change in lighting may reflect its internal transformation. Thus, the authors of this study agreed with the conclusions of K. Svensson & W. Bergman about the interpretative potential of this approach, but proposed a broader interpretation of environmental storytelling as a polyphonic visual language capable of combining plot, metaphor, and atmosphere.

The research by E. Ioannou & S. Maddock (2023) focused on the use of Neural Style Transfer for AI styling. The researchers showed the technical ability to adapt artistic styles in real time. Current research has confirmed the effectiveness of this tool, but also hypothesised its potential to create a personalised visual experience that varies depending on the player's choice or emotional state. This idea was presented to a lesser extent by E. Ioannou & S. Maddock, however, was becoming relevant in the context of the general trend towards individualising gaming practices. Similar considerations were observed in the study by S.A. Alharthi (2025), who analysed the role of generative artificial intelligence in game design. The researcher showed that AI significantly expands the possibilities at the stages of ideation and prototyping, increasing the productivity and variety of content. Simultaneously, the danger of excessive dependence on algorithms was noted, which can lead to a loss of originality and unification of artistic solutions. The study resonated with these findings: integrating AI into visual practices does open up new creative scenarios, but it also focuses on cultural and aesthetic risks that go beyond purely technical efficiency.

M.F. Maleki *et al.* (2024), reviewing the latest practices for integrating large language models into the field of procedural generation, emphasised that these technologies open up new opportunities for creating meaningful and variable game content. The researchers noted that large language models are able to complement traditional procedural content generation algorithms, forming semantic depth and context, but efficiency is achieved only in combination with classical methods. The analysis carried out in this paper confirmed that procedural art not only remains relevant, but also significantly expands the boundaries based on examples like No Man's Sky or Unreal Engine 5. The combination of procedural algorithms and AI stylisation transforms it from a secondary tool to a full-fledged artistic method of world building, providing both visual variability and adaptability to the player's choices and actions. T. Zufri *et al.* (2022), who noted that even in the age of 3D graphics, the pixel style retains a unique aesthetic and cultural weight. The researchers stressed that pixel-art, despite the technological development of digital art, remains an integral part of contemporary design, as it combines nostalgia, recognition, and simplicity of visual language.

Regarding UI/UX design, J.M. Palm (2022) showed that the process of creating an interface in the gaming industry is based on close interdisciplinary collaboration and a constant balance between aesthetic expressiveness and functional clarity. The presented study was consistent with these findings, demonstrating that contemporary games are increasingly view the interface not only as a convenience tool, but also as an element of artistic style that can shape the aesthetics of the game. This allows expanding the understanding of UI/UX as a comprehensive visual and communication strategy that combines practical effectiveness and cultural and aesthetic functions. The study by H. Engström (2020) emphasised the interdisciplinarity of video game development as a complex cultural and technical phenomenon. The results confirmed this thesis: graphics, narrative, sound, and interface design are interconnected to create a holistic visual experience. Simultaneously, the authors of the current study concretised this idea, showing that visual practices act as a link between technological innovation and artistic design.

Thus, the study generally confirmed the conclusions of previous scientific papers, but also expanded their range by integrating a cultural perspective. While most researchers focused on technical or functional aspects, the analysis showed that visual practices in video games are also carriers of cultural memory, identity, and metaphorical thinking. This suggests that the visual style of contemporary games should be considered not only as an aesthetic tool, but also as a holistic strategy that combines artistic, technological, and cultural dimensions.

CONCLUSIONS

In the course of the analysis of contemporary visual practices in video games, it was found that the visual component plays a central role in shaping the gaming experience. The analysis showed that it is the graphic

style that determines not only the aesthetic appeal of the project, but also directly affects the cultural recognition of the game and its commercial success. It has been proven that the use of original artistic styles contributes to creating a unique atmosphere, enhancing emotional interaction and deeper immersion of the player in the game world. Special attention was paid to AI stylisation and procedural art. It was found that the integration of deep learning algorithms and automated content generation significantly expands the capabilities of designers and allows creating large-scale, variable, and inclusive game spaces. The analysis showed that due to these technologies, the production process becomes more flexible and efficient, time and financial costs are reduced, and simultaneously the quality and stability of visual content is improved.

The study also showed that UI/UX design and environmental storytelling principles form key mechanisms of interaction between the player and the game. Intuitive interfaces and a well-designed visual narrative environment have been proven to increase user engagement, make it easier to master mechanics, and encourage them to stay in the virtual world for a long time. Cinematic presentation, in turn, provides emotional richness, promotes the development of drama and brings the game experience closer to traditional audio-visual arts. A separate result of the analysis was the identification of the growing importance of cross-platform connectivity. It has been proven that adapting graphics to various devices – from mobile to VR/AR – is a necessary condition for the versatility and competitiveness of gaming products, and ensuring their wider audience availability and compliance with contemporary market trends. The prospects for further research should be directed to the study of synergy between traditional artistic methods and innovative visualisation technologies, in particular, considering the local cultural context, the principles of inclusive design, and the needs of users with different capabilities.

REFERENCES

[1] Alharthi, S.A. (2025). Generative AI in game design: Enhancing creativity or constraining innovation? *Journal of Intelligence*, 13(6), article number 60. doi: 10.3390/jintelligence13060060.

[2] Babii, N.P. (2020). Aesthetics of modernity at the turn of the century: Modern – postmodern – hypermodern – metamodern. *Philosophy and Political Science in the Context of Modern Culture*, 11, 23-33. doi: 10.31866/2410-1915.21.2020.207866.

[3] Bergman, E., & Hermansson, T. (2023). *Effect of head-up display design on game immersion.* (Bachelor's thesis, Umeå University, Umeå, Sweden).

[4] Bracikowska, N.A. (2021). Environmental storytelling – the liminal space between embedded and emergent narrative. *Currents: A Journal of Young English Philology Thought and Review*, 6, 163-180.

[5] Engström, H. (2020). *Game development research*. Skövde: University of Skövde.

[6] Epic Games. (n.d.). *Store*. Retrieved from https://store.epicgames.com/uk.

[7] Fukaya, K., Daylamani Zad, D., & Agius, H. (2023). Intelligent generation of graphical game assets: A conceptual framework and systematic review of the state of the art. *ACM Computing Surveys*, 57(5), article number 118. doi: 10.1145/3708499.

[8] Google Play Games. (n.d.). Retrieved from https://play.google.com/store/games.

[9] He, J. (2024). A study on the influence of artificial intelligence on image art design. *SHS Web of Conferences*, 181, article number 04028. doi: 10.1051/shsconf/202418104028.

[10] HoYoLAB. (n.d.). Retrieved from https://www.hoyolab.com/circles/2/27/official?page_type=27&page_sort=hot.

[11] Ioannou, E., & Maddock, S. (2023). Neural style transfer for computer games. *arXiv*. doi: 10.48550/arXiv.2311.14617.

[12] Kaasinen, I. (2023). *Texturing process in hand painted low poly game art*. (Bachelor's thesis, Tampere University of Applied Sciences, Tampere, Finland).

[13] Khan, A., Shokrizadeh, A., & Cheng, J. (2025). Beyond automation: How designers perceive AI as a creative partner in the divergent thinking stages of UI/UX design. In *CHI'25: Proceedings of the 2025 CHI conference on human factors in computing systems* (article number 1105). New York: Association for Computing Machinery. doi: 10.1145/3706598.3713500.

[14] League of Legends. (n.d.). *YouTube*. Retrieved from https://www.youtube.com/@leagueoflegends.

[15] Maleki, M.F., Ferreira, L.B., Baldwin, A., Francis, K., & Togelius, J. (2024). A survey with insights on emerging LLM integration. *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment,* 20(1), 167-178.

[16] Nintendo. (n.d.). Retrieved from https://www.nintendo.com/us/?srsltid=AfmBOorjrOzGfEBCghsnTyvO-6Wt drqebs8mPdtFolLV0OnuthAOUCYH.

[17] No Man's Sky. (n.d.). Retrieved from https://www.nomanssky.com/news.

[18] Okur, M., Kızıl, R., & Atamaz, E. (2024). The art of graphic design in video games: Beyond the visual. *Amazonia Investiga*, 13(78), 9-26. doi: 10.34069/AI/2024.78.06.1.

[19] Palm, J.M. (2022). *User interface design in game development: How does the game industry create user interface design?* (Master's thesis, University of Skövde, Skövde, Sweden).

[20] Pretty, E.J., Guarese, R., Dziego, C.A., Fayek, H.M., & Zambetta, F. (2024). Multimodal measurement of cognitive load in a video game context: A comparative study between subjective and objective metrics. *IEEE Transactions on Games*, 16(4), 854-867. doi: 10.1109/TG.2024.3406723.

[21] Skorobogatova, A. (2023). *Real-time global illumination in Unreal Engine 5.* (Master's thesis, Masaryk University, Brno, Czech Republic).

[22] Sony Interactive Entertainment. (n.d.). *PlayStation*. Retrieved from https://www.playstation.com/uk-ua.

[23] Stewart, B. (2015). Environmental storytelling. *GameDeveloper*. Retrieved from https://www.gamedeveloper. com/design/environmental-storytelling.

[24] Sumi-e. (n.d.). *What is sumi-e?* Retrieved from https://www.sumi-e.it/en/what-is-sumi-e/.

[25] Svensson, K., & Bergman, W. (2024). Beyond the boxes: Analyzing environmental storytelling in unpacking. *SSRN*. doi: 10.2139/ssrn.4998331.

[26] Unreal Engine. (n.d.). Retrieved from https://www.unrealengine.com/en-US.

[27] Valve Corporation. (n.d.). *Steam*. Retrieved from https://store.steampowered.com.

[28] Valve Developer Community. (n.d.). *Commentary system*. Retrieved from https://developer.valvesoftware. com/wiki/Commentary_System.

[29] Vargas-Aguilar, R.D.C., Banda, I.C.R., Trujillo Pajuelo, M.L., & Cotito-Mujica, A. (2024). Data analysis on cinematic language in video games. In *2024 IEEE 7th international conference on computer and communication engineering technology (CCET)* (pp. 69-73). Beijing: IEEE. doi: 10.1109/CCET62233.2024.10837757.

[30] Wibowo, M.C., Nugroho, S., & Wibowo, A. (2024). The use of motion capture technology in 3D animation. *International Journal of Computing and Digital Systems,* 15(1), 1063-1074. doi: 10.12785/ijcds/150169.

[31] Wu, Z., & Oktrova, M. (2024). Impact of virtual reality technologies on the perception and interpretation of contemporary art. *Interdisciplinary Cultural and Humanities Review*, 3(2), 6-15. doi: 10.59214/cultural / 2.2024.06.

[32] Zheng, X. (2024). The application and development of toon shading technology in mobile games. *Applied and Computational Engineering*, 76, 302-310. doi: 10.54254/2755-2721/76/20240624.

[33] Zufri, T., Hilman, D., & Frans, O. (2022). Research on the application of pixel art in game character design. *Journal of Games, Game Art, and Gamification*, 7(1), 27-31. doi: 10.21512/jggag.v7i1.8565.

Аналіз світових візуальних практик у розробці ігрових проєктів

Олександр Когутяк

Аспірант

Прикарпатський національний університет імені Василя Стефаника

76018, вул. Шевченка, 57, м. Івано-Франківськ, Україна

https://orcid.org/0009-0003-5659-2500

Надія Бабій

Доктор мистецтвознавства, професор

Прикарпатський національний університет імені Василя Стефаника

76018, вул. Шевченка, 57, м. Івано-Франківськ, Україна

https://orcid.org/0000-0002-9572-791X

Анотація. Актуальність дослідження зумовлена зростаючим впливом візуальних практик на формування естетики, наративу та користувацького досвіду у відеоіграх, що робить їх одним із ключових чинників розвитку глобальної ігрової індустрії. Мета статті полягала в аналізі провідних тенденцій візуалізації, які визначають художні й технологічні особливості ігрових світів останнього десятиліття. Дослідження базувалося на компаративному та системно-аналітичному підході й включало контент-аналіз ігор, інтерпретацію їхнього візуального дизайну та огляд наукових джерел. Загалом було проаналізовано 23 ігрових проєкти різних жанрів і стилістик, що дало змогу виявити закономірності у розвитку візуальної складової індустрії та простежити взаємозв'язок між естетичними рішеннями, технологічними інноваціями й комерційним успіхом. До вибірки увійшли як високобюджетні AAA-проєкти, так і незалежні інді-ігри, що дозволило отримати більш комплексне бачення сучасних підходів до дизайну. Аналіз показав, що актуальні практики охоплюють стилізовану графіку, cel-shading, піксель-арт, sumi-е та новітні рішення на основі штучного інтелекту, включно з процедурним мистецтвом і генеративною стилізацією. Виявлено, що важливу роль відіграє дизайн користувацького інтерфейсу та досвід користувача, який визначає інтуїтивність і зручність взаємодії, а також «environmental storytelling» як форма безсловесного наративу, що поглиблює емоційний зв'язок користувача з ігровим світом. Особливу увагу приділено використанню кінематографічних технік і інтерактивної режисури, що забезпечують гібридність ігрового досвіду та зближують відеоігри з іншими формами аудіовізуальних мистецтв. Результати дослідження можуть бути використані геймдизайнерами, художниками, освітянами та дослідниками цифрових медіа як аналітична база для розробки візуально цілісних і комерційно успішних ігор, а також у сфері освітнього дизайну, культурної аналітики й створення інклюзивного візуального середовища

Ключові слова: стилізація; процедурна графіка; UI-дизайн; кінематографічність; адаптивність; геймдизайн; наратив