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DESIGNING FOR EVERYONE: HOW MOTION DESIGN IMPROVES ACCESSIBILITY AND EMOTIONAL INTELLIGENCE

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Abstract
The article examines the theoretical and practical aspects of using motion design as an effective tool for creating accessible and inclusive digital interfaces. Particular attention is paid to the role of animation in reducing cognitive load, supporting navigation, sensory compensation and ensuring emotional comfort for users with various perception and health features. International accessibility standards, such as WCAG 2.2, are analyzed, as well as examples of successful use of motion design in educational platforms, mental health applications and social projects. The importance of emotional intelligence and visual empathy in digital design for the formation of a human-oriented user experience is emphasized. The results of the study confirm the significant role of motion design in creating universal and adaptive solutions that promote equal participation of all categories of users in the digital environment.

Keywords: motion design, digital accessibility, inclusive design, cognitive load, emotional intelligence, universal design, animation, visual empathy, WCAG 2.2, multimodal interfaces, user experience, digital interfaces, educational technologies, mental health.

The novelty of the article lies in the comprehensive study of the role of motion design as a key tool not only for improving the aesthetics of digital interfaces, but also for increasing their accessibility and inclusiveness. For the first time, the influence of animation on reducing cognitive load and emotional support for users with special needs is systematically considered, which goes beyond traditional approaches to design. Also innovative is the analysis of the integration of

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international accessibility standards (WCAG 2.2) with practical examples of the use of motion design in such areas as education and mental health. The article emphasizes the importance of emotional intelligence and visual empathy as factors that contribute to the creation of human-oriented and adaptive digital products, which opens up new prospects in the development of universal design.

In the context of the rapid growth of digital technologies and the spread of multimedia platforms, the relevance of design aimed at ensuring accessibility and ease of use for the widest possible range of users is significantly increasing.

Motion design, which is a modern trend in the field of multimedia, is defined as a field of design activity focused on the dynamic presentation of graphic information through animation. Animation is widespread in a wide range of applications, including television branding and identity , advertising materials, infographics , corporate video production, promotional videos, web design, film production (in particular, titles), gaming applications, mobile applications, and educational videos. The key characteristic of this direction is the integration of the principles of graphic design, typography , animation, cinematography, illustration, and photography. The evolution of technological solutions and the increasing pace of modern life affect the specifics of human perception of information [1, p. 60].

In the 21st century, the emergence of motion design (Motion Design) marked a new stage of development in graphic animation technologies. The term gained wide popularity after the publication of the book by Trish and Chris Meyer (Trish and Chris Meyer's), dedicated to the use of Adobe software After Effects and titled " Creating Motion Graphics ».

In the digital environment, inclusive design based on the principles of universal design is of primary importance. This concept is aimed at creating products that are accessible to the widest possible audience of users, regardless of their physical, sensory or cognitive characteristics. According to the World Health Organization (WHO), the number of people with various forms of disabilities exceeds one billion, which necessitates taking these features into account in digital design to ensure equal participation in social, educational and professional activities [2].

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Research results demonstrate the significant impact of animation and motion on improving the perception and understanding of digital interfaces. In particular, scientists C. Ho and A. Pradhan argue that correctly implemented motion design helps improve user navigation in the content structure, reduce cognitive load and optimize interaction with the interface [3]. This aspect is of particular importance for users with neurological or cognitive disabilities, such as autism, attention deficit hyperactivity disorder (ADHD) and dyslexia .

Moreover, research by Y. Kim and S. Lim suggests that movement can be used as an additional communication channel for the hearing impaired [4]. For example, visual cues conveyed through animation can duplicate or replace audio information. Similarly, for visually impaired users, movement can indicate navigation directions or highlight key interface elements, thereby facilitating the interaction process.

J. Sweller's theory of cognitive load emphasizes the importance of structured presentation of information, especially in educational and interactive systems [5]. Motion design, which uses step-by-step animations, visual transitions, and microinteractions , helps reduce excess cognitive load due to the logical and predictable behavior of interface elements. No less important is the approach presented in the works of D. Norman , which emphasizes the need to design interfaces consistent with users' mental models [6]. Animation can be used as a tool for visually demonstrating cause-and-effect relationships between user actions and interface responses.

International standards such as Web Content Accessibility Guidelines (WCAG) 2.2, developed by the W3C consortium, contain specific requirements regulating the use of animation in web content. In particular, it is recommended to avoid excessive or unpredictable animation, which may cause disorientation or deterioration in the condition of users with vestibular disorders. At the same time, the use of animation is allowed if it improves the perception of information or simplifies navigation [7].

Consequently, the theoretical foundations of modern research confirm that motion design is not only an element of visual design, but also an effective means of creating an inclusive, accessible and emotionally responsive digital environment.

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When implemented correctly, motion design has the potential to significantly improve the accessibility of digital products. It helps create clearer and more user-oriented interfaces, which is especially important for people with perceptual, motor, or cognitive disabilities. Below are some key ways in which motion design can improve accessibility:

1. Sensory compensation and multimodality . Motion design plays a significant role in the creation of multimodal interfaces, where one sensory modality (e.g., visual) is compensated or supplemented by another (e.g., auditory). As an example, animation can visually signal the receipt of notifications or the occurrence of an error, compensating for the inability to perceive a sound signal.
2. Reduced cognitive load. According to cognitive load theory, animation helps the user process information more easily and consistently. Animated transitions can logically link actions and their consequences, helping people with short-term memory problems or autism spectrum disorders.
3. Support navigation and focus. Movement directs the user's attention by pointing to priority areas. This is especially important for people with attention deficit or neurodiversity , as dynamics help structure the interface.
4. Personalization and control. Modern interfaces give users the ability to adjust the intensity of animation (for example, the “reduce motion” function in iOS settings). This feature is important for people with vestibular hypersensitivity, since sudden movements can provoke dizziness or disorientation.

Motion design is therefore not only an aesthetic tool but also a functional tool for ensuring digital accessibility. Its impact varies depending on the characteristics of the target audience, so it is important to consider the specific needs of different user groups. The table below presents the main categories of users with special needs, typical difficulties when interacting with digital interfaces, and the ways in which animation contributes to improving the user experience.

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Table 1. Impact of motion design on accessibility for different user groups

User Group	Perception/interface issues	The Role of Motion Design
People with hearing impairments	Lack of perception of sound signals	Animation replaces sound for notifications and alerts
People with cognitive impairment	Difficulty perceiving the sequence of actions	Animation tidies up the interface and reduces the load
People with ADHD	Loss of focus, information overload	Animation helps to keep attention
People with vestibular sensitivity	Disorientation during sudden transitions	Possibility to disable/reduce animation
Elderly users	Slow reaction, difficulty in navigation interface	Smooth animations make it easy to understand

In accordance with Web recommendations Content Accessibility Guidelines (WCAG) 2.2, when developing animation solutions, the following principles must be observed:

- provide alternative options for moving elements (e.g. text notifications).
- avoid using flashes and abrupt transitions that may trigger seizures in people with epilepsy.
- provide the ability to control animation (on/off, adjust playback speed).
- use intuitive animations that help understand actions rather than distract.

Current research in digital communications highlights the importance of emotional intelligence as one of the key determinants of the quality of interaction between a user and a digital product. Visual elements, especially in the context of motion design, have the potential to convey emotional signals and stimulate empathic engagement, making them a powerful tool for creating intuitive and human-centered user experiences.

Emotional intelligence is defined as the ability to recognize, understand, and regulate one's own emotions and the emotions of others [8]. In the context of digital design, emotional intelligence is realized through the conscious choice of visual, color, animation, and typographic solutions that not only inform but also evoke an emotional response in the user [6].

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Motion design can convey emotional states through parameters such as speed, trajectory, scale, and smoothness of movement. For example, smooth and slow appearance of objects can create a feeling of calm and safety, while abrupt and chaotic movements can cause anxiety or tension.

Visual empathy is the ability of a design to evoke empathy, emotional responsiveness, and understanding of the user's mood, state, or needs. An empathetic interface promotes not only rational but also emotional immersion of the user in the content [9]. In this context, motion design functions as a channel for transmitting nonverbal information. It can visualize the emotional states of characters (e.g., in educational or therapeutic applications), support the tone of the interface (friendliness, severity, care), and create a sense of "liveness" and involvement.

In practice, the principles of emotional intelligence and visual empathy are widely used in various areas of digital design. This is especially noticeable in human-oriented projects, where priority is given not only to functionality, but also to the emotional comfort of the user:

- Digital mental health services (e.g. Calm , Headspace) use minimalist and smooth motion design to reduce anxiety and promote relaxation.
- in educational platforms, animation helps to create a trusting and friendly space for users with different levels of training or cognitive abilities [10].
- in social projects aimed at inclusion, visual empathy is manifested in the use of animation to express emotions in characters with disabilities - this increases understanding and acceptance by a wider audience.

The use of motion design in various areas of digital interaction demonstrates that animation performs not only an aesthetic function, but also a critical communicative and inclusive function. This is especially relevant in the areas of education, social and government communication, and digital health, where it is necessary to ensure accessibility, emotional engagement, and respect for the diversity of user experience.

First, about educational platforms. Modern online educational platforms such as Khan Academy and Duolingo demonstrate the effectiveness of using animation to visualize complex concepts, improve cognitive acquisition, and increase motivation. Here, motion design acts as a "knowledge conductor," transforming

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abstract concepts into clear visual images that are tailored to the age, level of training, and even the perception of users. For example, Duolingo 's animations accompany each successful user action, creating positive reinforcement and stimulating regular participation. In addition, the app's characters demonstrate emotional reactions, creating empathic interaction and reducing anxiety during the learning process, which is especially important for children and users with learning disabilities.

Secondly, inclusive mental health apps. Apps like Headspace, Calm and Mindfulness Coach , motion design is used to create a soft, unobtrusive visual environment. The animation in these apps is aimed at reducing anxiety, regulating breathing, helping with relaxation and focusing. The movement of elements is slow and predictable, often synchronized with breathing cycles or voice instructions, which helps to create a feeling of safety and comfort.

Headspace also uses characters and visual metaphors to explain psychological processes - from anxiety to insomnia - through simple and visually supportive images, making the information more accessible to a wide audience, including people with low visual literacy or cognitive limitations.

Third, government and non-governmental projects. Organizations working in the field of global health and education, such as the UN and WHO, actively use animated videos and infographics in their information campaigns. These materials allow for the effective transmission of key messages to multicultural and poorly educated audiences, minimizing language and cultural barriers.

For example, during the COVID-19 pandemic, motion design was used to create accessible visual instructions on how to prevent the virus. Animations demonstrated how to properly wash hands, wear masks, and maintain social distance. The simplicity and universality of the visual language ensured a high degree of understanding regardless of the recipient's level of education and language.

Thus, motion design is not only an aesthetic tool, but also an effective means of increasing accessibility and developing emotional intelligence in the digital environment. Its application in the context of universal design contributes to the creation of more equitable and inclusive solutions that can improve the quality of

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life of all users. When developing animated interfaces, it is necessary for designers to consider both the technical and psychological aspects of interaction.

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