Theory and Practice of Science and Technology
2025, VOL. 6, NO. 12, 111-113
DOI: 10.47297/taposatWSP2633-456923.20250612

Narrative Structure and Expression of Visual Communication Design in Multi Media Context

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ABSTRACT
The multimedia context breaks the static boundaries of traditional visual communication and promotes a shift in design paradigms towards dynamic narrative and interactive experiences. Traditional one-way communication has become ineffective in the digital field. To address this issue, we should focus on the restructuring mechanism of narrative structures such as nonlinear logic and spatial architecture, and combine dynamic graphic encoding and multi sensory immersion technology to analyze advanced strategies for visual expression. By deconstructing and analyzing practical cases such as interactive digital exhibitions, it is demonstrated that audience behavior intervention can reshape narrative texts. The research results indicate that the use of adaptive interaction mechanisms and cross channel sensory fusion can effectively solve the problem of cognitive discontinuity in fragmented information contexts. Establishing a new paradigm of visual communication centered on embodied experience has achieved a value shift from information dissemination to meaning co construction.

KEYWORDS
Multimedia; Visual communication design; Narrative structure; Expression

1 Introduction

In the digital ecosystem of the Internet of Things, the audience's attention resources are infinitely diluted by the influence of massive information. Faced with the reality of diminishing marginal effectiveness in communication, visual communication design is no longer just about constructing a flat order of graphic symbols, but is endowed with a new mission of connecting technological rationality and humanistic emotions. In this context, narratology, as a core strategy for organizing experiences and constructing meaning, has become a key support point for reshaping design logic. It requires a shift in design practice from a purely visual rhetorical level to a holistic arrangement of temporal and spatial order and sensory experience, thereby re establishing the depth and stickiness of information dissemination in complex digital contexts.

2 The Evolution of Visual Communication Design Characteristics in Multi Media Context

In the context of multimedia, all static flat paradigms of the traditional printing era are gradually being deconstructed and replaced by a new visual language based on screens and virtual spaces. The design object is no longer limited to the physical arrangement of two-dimensional space, but is endowed with a temporal dimension. With the help of dynamic graphics and algorithm technology, static information is transformed into a continuous visual flow with narrative rhythm, achieving a leap from "instant freezing" to "spatiotemporal interpretation". With the continuous expansion of formal dimensions, the reconstruction of information dissemination relationships has become a more critical evolutionary feature. The audience identity has shifted from passive information receivers to active content co builders, directly participating in the narrative process through interactive behaviors such as touch and gestures. The visual form generates real-time feedback based on user operations, completely breaking down the one-way barrier between communicators and receivers. Furthermore, this interactivity promotes the evolution of single visual senses towards multidimensional sensory synesthesia, where images, sounds, and tactile feedback are closely and deeply integrated to construct a comprehensive immersive information field. This means that visual communication design has ultimately achieved a paradigm shift from simple symbol notification to holistic experience generation.

3 The influencing factors of narrative in visual communication design in multimedia context

The influencing factors of visual communication design narrative mainly consist of three parts: individual differences of narrative participants, narrative discourse construction, and narrative communication context. They are the key factors affecting the success or failure of narrative and play an important role in narrative from three different levels. The subjective factors of narrative participants and the objective factors of narrative text constitute the influencing factors of visual communication design narrative, which affect narrative behavior from different levels and together constitute the influencing factors of the success or failure of narrative dissemination. From the perspective of the narrative subject, the audience's existing cognitive patterns, perceptual experiences, and imaginative abilities constitute the underlying logic of information decoding, especially in the non-linear interactive digital field. The personalized perceptual characteristics of

users directly determine their way of restructuring fragmented information and the path of meaning generation. Different cognitive models can lead to vastly different narrative experience results.

At the same time, the objective quality of the narrative text itself is the fundamental support for the experience. This requires clear thematic content, coherent plot development, and emphasizes maintaining high contextual relevance and strong visual tension in multi-dimensional time and space. Only in this way can we ensure that discrete interactive nodes form a logical loop through rigorous visual indexing, avoiding understanding gaps caused by information jumps. In addition, the selection of narrative media and the communication context constructed by their specific usage scenarios, as external constraining forces, define the physical boundaries and immersion depth of narrative unfolding. The technical attributes and usage methods of the media itself must be highly adapted to the narrative content.

4 Narrative optimization and expression advancement of visual communication design in multimedia context

4.1 Constructing an Interactive Narrative Mechanism that Fits the Audience's Cognitive Patterns

The multimedia environment endows the audience with great autonomy in information filtering. Visual design needs to shift from one-way content output to dynamic adaptation of user psychological models. The core of interactive narrative mechanisms is to establish a feedback system that can sensitively perceive the cognitive load of the audience. Designers need to preset multi-dimensional intervention nodes within the information architecture to balance differentiated interpretation needs. For audiences with high engagement, the interface should reserve implicit indexes for deep exploration, inducing them to independently explore narrative potential; For general viewers, visual guidance systems need to strengthen explicit feedback to effectively reduce the threshold for understanding. This mechanism promotes a moderate delegation of narrative dominance, transforming simple visual reception into co creation at the level of thinking, ensuring that information communication maintains logical coherence and depth of experience in non-linear operational paths, and achieving precise alignment between design intent and audience psychology.

Taking a certain "Intangible Cultural Heritage Technology Digital Map" interactive platform as an example, the system abandons the traditional linear display method of chronology and instead adopts an "adaptive narrative flow" scheme formed based on user behavior trajectory. The initial interface presents a macro level technique genre nebula diagram, and the audience can click on any node to trigger the sinking and focusing of the narrative perspective. The interactive logic here does not force the locking of browsing order, but embeds a dual track narrative window of "panoramic browsing" and "micro study". When the backend detects that the user stays on a specific page for a short time and slides quickly, the algorithm automatically determines it as a general reading mode, and the interface simplifies obscure technical terms, focusing on presenting 3D dynamic demonstrations of finished product forms and color aesthetic features, reducing cognitive resistance; On the contrary, if the user repeatedly scales or triggers a comparison operation on a key process parameter, the system immediately activates the deep learning mode, and the sidebar synchronously displays detailed raw material ratio maps, temperature control curve data, and related literature traceability, and automatically associates horizontal comparison charts of similar techniques. This differentiated visual response mechanism can effectively avoid cognitive overload caused by massive professional information to ordinary audiences, and can also meet the strict requirements of professional researchers for knowledge granularity, achieving maximum narrative effectiveness among different audience groups.

4.2 Strengthen and Enhance the Dynamic Visual Grammar of Text Logic Coherence

In a multimedia environment, discrete information nodes can easily lead to narrative gaps, and dynamic visual grammar should be the key logical adhesive to bridge this gap. In design practice, it is necessary to introduce the temporal dimension into the visual coding system, giving static symbol forms and rhythm changes. This dynamic demonstration is not simply visual rhetoric, but carries a clear guiding function, which can use the growth, displacement, or deformation of graphics to establish a strong visual index. When visual elements have temporal attributes, they can establish inherent causal relationships between different levels of information, guiding the audience's gaze to achieve smooth transitions in complex non-linear texts, thereby ensuring that narrative logic can still maintain tight coherence and integrity in the context of jumping browsing.

Taking the "Global Climate Evolution Trends" dynamic visualization interactive system as an example, the platform has designed a dynamic transition syntax based on data logic to parse complex climate attribution relationships. When users check the "Carbon Emission Surge" section, the interface does not abruptly jump to cut off the current view, but uses the evolution of vector graphics to transform the data stream into concrete visual metaphors. The carbon emission curve in the center of the screen will smoothly evolve into the melting rate curve of polar glaciers according to the timeline rhythm after being triggered by the user. The thickness of the lines and the warning redness of the color will produce instant pulsations as the values climb. This continuous deformation in form intuitively reveals the causal chain between "emissions" and "melting", filling the cognitive gap between different data modules. If the audience further clicks on a

specific area, the view will delve into the microscopic level with a "microscopic" zoom effect, displaying the details of temperature rise in a particular sea area, while the dynamic afterimages that always retain the macroscopic trend in the background serve as a reference. The entire visual system utilizes the continuity of motion trajectories to connect isolated statistical data into a narrative chain with strong logical direction, forcing the audience to naturally learn the evolutionary laws behind the data under the guidance of visual flow, effectively avoiding the logical fragmentation that may arise from fragmented browsing.

4.3 Create an Immersive Experience Field that Adapts to Multi-dimensional Communication Scenarios

In multimedia communication, it is difficult to maintain people's attention for a long time solely relying on visual stimuli. In this case, the designed solution needs to use all the spatial dimensions of wrapping to eliminate the gap between virtual information and the real environment. The cross channel fusion formed by light, sound, and tactile feedback is no longer just an auxiliary embellishment, but has become a crucial component of the narrative itself. Together, they play a role in the audience's perceptual system, establishing a psychological sense of presence. This contextualized expression logic requires transforming the narrative object from an "object" to an "environment", forcing the audience to perceive information as an "insider", using comprehensive sensory resonance to enhance the penetration of narrative content, and thus achieving efficient and deep meaning implantation in complex communication noise.

Taking the digital science popularization exhibition design of "endangered ecosystems" as an example, this plan can attempt to construct an "ecological empathy field" based on real-time data, rather than traditional graphic and textual display methods. The design should utilize holographic projection mapping technology to transform enclosed physical spaces into dynamic virtual ocean environments, where walls and floors no longer present static images but serve as dynamic canvases carrying ocean current data and biological population density. Infrared thermal sensing and gravity pressure sensing devices can be deployed inside the space to capture the displacement trajectory and duration of visitors' stay. When the audience enters a specific area, the virtual coral community under their feet can exhibit visual effects of fading, whitening, or even breaking due to the pressure of "human invasion". At the same time, with the directional sound mask outputting low-frequency breaking sounds, this real-time negative feedback mechanism directly transforms abstract ecological damage data into visual pain points that the audience's body can perceive. In addition, the environmental lighting system should be linked to the narrative climax, gradually dimming the color temperature as the degree of ecological degradation intensifies, and using the oppressive atmosphere to force the audience to reflect on ethical aspects. The key point of this design plan is to transform objective scientific research data into sensory experiences that can be personally experienced, using technological means to break through the safe distance between the audience and the displayed content, causing the audience to vibrate both physically and psychologically, and achieving a deep recognition of ecological protection issues.

5 Conclusion

The expansion of multimedia contexts has enabled visual communication design to go beyond simple physical media replacement, triggering fundamental changes in communication logic and perception methods. The study of narrative in visual communication design is a comprehensive and systematic research, which is an important contemporary topic in the prevalence of visual culture. Visual communication design has diverse forms of narrative expression, including two-dimensional and three-dimensional static spatial narratives, as well as four-dimensional dynamic spatiotemporal fusion narratives. It is a comprehensive narrative type that includes both flat forms such as posters, books, packaging, and mobile images such as the internet and new media. This diverse form of expression and narrative media determines the diversified characteristics of its narrative design techniques. The delegation of narrative power to the audience means that future design practices will no longer be limited to formal aesthetic embellishments or simple technical showdowns, but will shift towards deep exploration of interactive behavior and emotional resonance. In the digital landscape where the boundaries between virtual and reality are gradually becoming blurred, visual communication design will ultimately return to the focus on human experience, finding a new balance between rational algorithmic logic and emotional humanistic spirit, and building a meaningful community with emotional warmth.

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