The Impact of Digital Media Technology on Animation Design - Postprint

Authors: Liu Chang

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Abstract

In recent years, digital media technology has experienced rapid development, driving progress across multiple industries. In the field of animation design, the application of digital media technology has brought about significant changes in animation expression methods, enriched the content of animation expression, and effectively enhanced the level of animation design. Therefore, digital media technology has an important influence on animation design. Based on this, this paper begins with a basic introduction to digital media technology, analyzes the specific content of how digital media technology influences animation design, and proposes several measures for the effective application of digital media technology in animation design, for reference.

Full Text

The Impact of Digital Media Technology on Animation Design

Liu Chang
Daqing Television Station, Daqing, Heilongjiang 163000

Abstract: In recent years, digital media technology has developed rapidly, driving progress across multiple industries. In the field of animation design, the application of digital media technology has fundamentally transformed animation expression methods, enriched animation content, and effectively enhanced animation design standards. Consequently, digital media technology exerts significant influence on animation design. This paper begins with a fundamental introduction to digital media technology, analyzes its specific impacts on animation design, and proposes several measures for the effective application of digital media technology in animation design to serve as a reference.

Keywords: animation design; digital media technology; digitization; enhanced effects; compatibility and sharing

1.1 Overview

Digital media technology represents a novel integration of art, digital technology, and media technology. It essentially utilizes binary code to process and transmit information, with carriers encompassing physical media, sensory media, and logical media. Generally speaking, digital media can be understood in both narrow and broad senses. In the narrow sense, it refers to sensory media, including digital animation and audio. In the broad sense, it also includes display media —corresponding display devices such as input and output devices like monitors and projectors that convert electrical signals into sensory media. Additionally, storage media such as USB drives and hard disks store sensory media codes in digital form. Digital media possesses distinct characteristics compared to traditional media and can effectively integrate with cultural industries such as film, television, and journalism, thereby promoting their healthy development.

1.2 Characteristics

Digital media technology facilitates information circulation through digital storage and interactive transmission, enhancing media interactivity and enabling bidirectional information dissemination. Digital technology can accomplish challenging tasks in media production and integrate diverse information categories—including audio, images, and text—demonstrating strong integration capabilities that effectively improve the quality of short videos, films, and animations. Furthermore, digital media technology enriches media creation forms and exhibits considerable potential for enhancing 趣味性.

2.1 Promoting Technological Transformation in Animation Design

Traditional animation design relied on manual drawing by designers, with subsequent modification and conversion during post-production being particularly cumbersome and labor-intensive. With the rise of digital media technology, designers can now utilize computers to create characters, scenes, and digital paintings, significantly reducing workload while facilitating easier modification and conversion. The application of digital media technology in animation design has driven positive transformation in the animation production field. Through the effective integration of Flash animation technology, layer processing techniques, and scene-sound transformation technology, animation expression forms have been enriched. Computer software enables fine-tuning of animation design at any time, yielding superior detail effects. Moreover, digital media technology has improved animation frame rates and enhanced 画面流畅度. Traditional animation suffered from insufficient frame rates due to technical limitations, resulting in poor viewing fluidity. With digital media technology, animation sequences can be processed through corresponding computer software, making character movements and expressions more natural and 流畅. The 2D and 3D effects of

scenes enhance the aesthetic appeal and grandeur of animation settings, driving positive transformation in the animation industry.

2.2 Enriching Expression Forms in Animation Design

Animation design constitutes a form of media art expression, and as times evolve, the novelty of animation materials has become an important factor influencing animation industry development. Digital media technology further enriches animation design materials, breaking through fixed animation expressions in traditional design and presenting audiences with more diverse visual expression forms. Supported by digital media technology, animation audio-visual elements can be expressed in multiple forms, breaking the limitations of traditional black-and-white animation by incorporating various elements to highlight animation characteristics.

2.3 Enhancing Dynamic Effects in Animation Design

Traditional animation design was constrained by technology, resulting in relatively monotonous expression forms and weak dynamic effects. The application of digital media technology has significantly improved animation design standards. In animation design, digital media technology primarily manifests through computer-based information recording and storage, clarifying logical relationships and sensory perception between elements. Sensory perception constitutes a crucial element affecting animation quality, and digital media technology leverages computer programming to present animation works through media playback. Excellent domestic animations such as *Big Fish & Begonia*, *Qin' s Moon*, *Journey to the West*, and *Douluo Continent* all demonstrate the importance of digital media technology application. Through digital media technology, animation design becomes more flexible and vivid, substantially improving both dynamic and visual effects. Three-dimensional animation presentation provides audiences with new sensory experiences, making characters more lifelike, backgrounds clearer and more realistic, and 画面融合性更强, thereby delivering better immersive experiences. The interactivity between animation design and digital media technology makes animation effects more prominent, with characters becoming realistically three-dimensional, ultimately creating works that provide audiences with superior experiences and enhanced animation vitality.

2.4 Optimizing the Animation Design Process

The application of digital media technology in animation design has effectively optimized production procedures. Complex drawing tasks, post-production modifications, adjustments, and modeling in traditional animation design have been simplified through digital media technology. Simultaneously, with the support of digital media technology, efficient and secure storage pathways facilitate the entire workflow chain of animation design, production, and distribution, enriching promotional methods for animation works and reducing animation production costs.

2.5 Improving Compatibility and Sharing in Animation Design

Digital media technology has enhanced animation design standards, gradually expanding the market influence of the animation industry and its affiliated industries and increasing the value of animation works. For instance, Disney' s classic animation *Frozen* developed derivative industries including character comics, dolls, games, clothing, and decorations, driving healthy development of the animation industry chain. In other words, digital media technology has diversified the forms of the animation industry and its affiliated industries. Leveraging network information technology, the influence of animation works continues to expand, and the animation industry market shows promising prospects. The effective integration of digital media technology and network information technology has spawned numerous animation derivatives. As a form of artistic culture, animation benefits from the compatibility and openness of digital media technology, enabling diversified development in animation dissemination. Animation design can integrate big data and digital media technologies to conduct market research and widely solicit opinions from animation enthusiasts, thereby better grasping market demands during design and continuously optimizing characters and scenes. Under the support of digital media technology, animation production standards are effectively improved, fully demonstrating design value.

3. Principles of Animation Design Transformation

Digital media technology-based animation design primarily utilizes temporal animation tools like Flash, which begins by dividing design layers into mask layers, guide layers, and normal layers. After establishing relationships between layers, a new guide layer is formed. The most critical aspect of animation design is achieving 画面变化, which constitutes the main content of temporal animation work. Typically conducted under the premise of temporal animation, the design process generally employs advanced animations as a foundation, with the overall process heavily relying on basic animation techniques and timelines for fundamental design, enabling multiple target association transformations within the same 画面. When temporal animation 画面发生变化, corresponding target positions require fixation and arrangement to transform static images into animation. The specific animation design principle operates as follows: First, select any point on a curve, then identify the corresponding target based on the selected point. After recording, set the target category, movement speed, and range for the selected point, then use command control to enable movement along a predetermined path, completing free-point curve motion. Second, due to geometric constraint relationships between points in animation design, when one point moves, other points change accordingly, and different movements between points generate overall 画面运动效果. Furthermore, any variable point in animation design is a free point with associated objects; if the free point changes, its associated objects also change, and their geometric relationships are affected.

4. Measures for Effective Application of Digital Media Technology in Animation Design

In 2D animation design, digital media technology primarily manifests in two aspects. First, it mainly functions on keyframes through reasonable selection and subsequent input of relevant data information according to specific design requirements, enabling rapid automatic generation of animation scenes in device software while maintaining scene clarity. Additionally, applying digital media technology in 2D animation can effectively improve the quality and efficiency of 描线处理, allowing automatic generation of images and animation scenes through simple image selection. In 3D animation design, the 思路 and process are more complex than in 2D animation, with higher visual effect requirements. Digital media technology better adapts to the technical demands of 3D animation design, demonstrating superior animation production effects and quality, thereby driving faster development of the animation industry.

4.1 Improving Domestic Animation Design Quality Through Advanced Technology As digital media technology continues to develop and upgrade, the animation industry must also constantly innovate to actively adapt to evolving demands. During animation design, advanced technology should be employed to improve quality based on actual industry needs. Designers should integrate animation with China' s cultural industry through technological innovation, thereby elevating animation industry development to a higher level. In current animation design, VR technology has been well-applied. Regular training on technology application is conducted in the animation design field, providing designers with professional platforms for learning and exchange while establishing animation VR base experience R&D centers to promote VR and AR technologies, further enhancing animation design technical standards and continuously improving animation design quality.

4.2 Optimizing Talent Cultivation Models Animation design quality is related not only to technological standards but also significantly influenced by designers' capabilities. Nowadays, the effective integration of digital media technology and animation design cannot be achieved without professional talent. Therefore, to enable more comprehensive integration between animation design and digital media technology, emphasis must be placed on cultivating professional talent. Currently, the animation design industry lacks professional talent, particularly creative and innovative individuals, and China still lags behind international animation design talent standards. Since talent cultivation depends on education, continuously innovating educational models will produce more high-level animation design professionals. Consequently, an increasing number of universities have implemented professional talent cultivation plans in animation education in recent years, providing reliable pathways for cultivating socially adaptable animation design skilled personnel. Furthermore, many universities and animation design studios have established school-enterprise cooperation, with guidance from both faculty and design experts to improve animation

design professional talent cultivation quality. Through collaboration between universities and outstanding social animation design studios, students learn relevant professional knowledge at school and then enter animation design studios for practical creation, enabling designers to gain deeper understanding of client needs and accumulate creative experience in favorable environments, ultimately producing novel works. Moreover, training animation design professionals enables them to better master digital media technology and network computer technology, ensuring their works better meet industry market demands.

4.3 Building Technology Exchange Platforms The animation design industry demonstrates promising development prospects as a leader in the new cultural industry, effectively driving affiliated industries and forming economic industry chains. To effectively elevate animation design industry standards, digital media technology must be fully explored, and technology exchange platforms should be constructed to enable more animation design talents to learn and exchange ideas, further leveraging digital media technology' s role and enriching their knowledge reserves. When encountering difficult technical problems during design, they can inquire and exchange ideas on the platform, a process that continuously stimulates their creative potential and produces higher-quality animation design works.

4.4 Designing Distinctive Domestic Animation with Digital Media Technology The rapid development of science and technology has continuously updated and transformed media dissemination forms. In the digital information environment, China' s animation industry development has produced more diversified animation production expression forms alongside continuous digital media technology innovation. For Chinese animation designers, the rapid development of digital media technology presents both opportunities and challenges. To better promote further development in the animation design industry, it is necessary to actively apply artificial intelligence, Internet+, VR technology, and other innovations to enhance animation design creativity and improve the quality and competitiveness of China' s animation products. To highlight advantages in animation design, it is essential to comprehensively grasp animation consumer needs using digital media technology and effectively integrate Chinese elements and culture to design and produce animation works with Chinese characteristics, thereby enhancing the quality influence of domestic animation and promoting long-term, stable development of the animation industry.

5. Development Trends in Animation Design

From the continuous transformation and development of animation design, future animation design will gradually shift from single-ending, single-storyline formats to multi-ending, multi-storyline parallel structures, further enriching animation content. In today' s social environment, China' s animation industry development is at a critical period, and international competition in the animation industry is reflected not only in animation production quality and effects

but also in competition of soft power between nations. To enable better development of the animation industry, the effective application of digital media technology holds significant importance. In the continuous integration and development of animation design and digital media technology, animation design professionals must possess sufficient knowledge and skills in digital media technology. Therefore, future composite professional talent will become the main force in the animation design field, continuously promoting the intelligence and informatization levels of animation design. For China' s animation industry to gradually enhance its international competitiveness, it must not only deepen digital media technology application but also fully integrate traditional Chinese culture and national spirit into design, highlighting Chinese characteristics in terms of connotation. This approach ensures animation design progresses not only technically but also inherits content and spirit well, better reflecting animation design quality and enabling China' s animation design standards to achieve higher-level advancement.

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Note: Figure translations are in progress. See original paper for figures.