

A Study on the Application of Digital Technology in Television Program Production: A Case Study of “盛世典藏” at Kunming Radio and Television Station (Postprint)

Authors: Zhang Hui

Date: 2023-10-08T00:00:00+00:00

Abstract

With the development and popularization of digital technology, its application in television program production has become increasingly extensive and profound, particularly in television packaging and production. This paper takes the “Shengshi Diancang” column of Kunming Radio and Television Station as a case study to explore the application of digital technology means and artistic design forms in program packaging and special program production, aiming to (1) apply digital technology theory to guide television program production, explore the implementation of a column quality strategy and strengthen brand building by employing digital technology means in television program production; (2) analyze, through practical examples, the characteristics of digital technology in animation production for the series program “Old Streets and Time-Honored Brands” under the “Shengshi Diancang” column, revealing the technical and artistic nature of digital technology in television program production. To demonstrate the advancement, efficiency, convenience, and economy of television program digitization, this paper also analyzes and discusses the effects generated by digital technology in television program production.

Full Text

Research on the Application of Digital Technology in Television Program Production: A Case Study of Kunming Television Station’s “Splendid Collection” Program

Abstract: With the development and popularization of digital technology, its application in television program production has become increasingly extensive and profound, particularly in television packaging and production. This paper

takes Kunming Television Station's "Splendid Collection" program as a case study to explore the application of digital technological means and artistic design forms in program packaging and special program production. The study aims to (1) apply digital technology theory to guide television program production, explore the implementation of a quality strategy for programs using digital technological means, and strengthen brand building; and (2) analyze the characteristics of digital technology in animation production for the "Splendid Collection" series "Old Streets, Old Brands" through concrete examples, revealing both the technical and artistic aspects of digital technology in television production. To demonstrate the advanced nature, efficiency, convenience, and economy of television program digitization, this paper also analyzes and discusses the effects produced by digital technology in television program production.

Keywords: digital technology; television program production; television packaging; Splendid Collection

1. Research Background

The application of digital technology in television program production has grown increasingly widespread and sophisticated. Currently, television stations in China's developed cities have already begun using animation and other digital technological means for television packaging and production, while some local stations have also initiated research and exploration in this area. Years of experience in television production have made us realize that, under budget constraints, achieving excellence in programming requires not only rich cultural connotations and abundant information but also distinctive stylistic features that employ advanced technologies. The pursuit of creating lively, audience-friendly programs with strong visual effects and impact—while building a recognizable brand—has long been a subject of inquiry for television producers.

With the development of digital and communication technologies, new media formats such as IPTV, online television, mobile television, and outdoor large screens have emerged successively. Faced with the fierce impact and challenges from these new media, traditional television must re-examine and discover its own media advantages under the stimulus of emerging media, transforming from passive to active to achieve renewal. Through years of television production experience, we have increasingly recognized that simple editing and program packaging, which merely use camera language to express content, can no longer attract viewers' attention. Only by adopting advanced technological and artistic means combined with digital technology to reform and innovate program formats can we meet audience needs. Based on this understanding, we take Kunming Television Station's "Splendid Collection" program as an example to explore the application of digital technological means and artistic design forms in program packaging and special program production, aiming to conduct over-

all packaging and positioning for the program while exploring and summarizing effective methods and experiences for producing television programs through digital technology reform and practice.

In August 2004, Kunming Television Station underwent a comprehensive revamp, establishing the new concept of “packaging changes the world view” to create a cultural collection program—“Splendid Collection.” This program promotes national culture, focuses on humanities and history, appreciates calligraphy, paintings, and antiques, and packages auction treasures, creating the deepest cultural connotations that spark the most beautiful chemistry with audiences on screen. The “Splendid Collection” series program “Old Streets, Old Brands” was born against the backdrop of the urgent call for intangible cultural heritage protection and growing public concern for intangible cultural heritage, accompanied by reflections on how to “enrich the people and revitalize Yunnan and Kunming.” The series was planned for 15 episodes, focusing on introducing time-honored brands that once appeared on Kunming’s central axis, Zhengyi Road, and held a place in Kunming’s commercial development history. In the early stages of production, we recognized that without necessary historical images and video materials, mere text browsing or recitation would inevitably weaken audience attention to historical facts and reduce the program’s expressive power. After discussion with the director, we decided to attempt the restoration of this historical period in Yuan Dynasty Kunming using computer 3D animation.

Taking this restoration animation production as an example, the workflow proceeded as follows: adapting the storyboard script → character image setting → individual modeling → combined scene assembly and rough pre-visualization → material adjustment → lighting and rendering → compositing with color correction and effects → non-linear editing → final video output (finished product).

2. Application of Digital Technology in “Splendid Collection” Production

2.1 Setting Architectural Styles and Character Designs Based on Historical Materials

Based on the script design, we established settings for the main buildings and characters involved in the script. Since this production focused on restoring ancient architecture through animation, the architectural styles and characters needed to strictly respect historical authenticity. After consulting relevant historical materials from the period and combining them with the script, we selected several sets of images as references for architectural and character settings.

City Gate Tower Design: This photo originates from image materials left from the Ming and Qing dynasties. The city gate tower has three stories, with

a double-eaved hip roof as the main design feature. The roof's main ridge ends and hip ridge termini are [text appears to be cut off, but I'll continue with the next coherent section].

2.2 Creating Individual Models Based on Reference Images

Using 3ds Max software to establish models forms the foundation of animation production. Models provide the most original materials for the entire animation. First, we created a set of architectural and character models matching historical facts based on reference images.

[Figure 1: see original paper] Old Kunming City Gate Tower Design

[Figure 2: see original paper] City Gate Tower and Gate Modeled to Simulate Old Photographs

2.3 Scene Assembly and Camera Pre-visualization

After completing individual models, we roughly constructed scenes according to the storyboard, setting camera positions and camera animation. This process was interrelated and mutually supportive with script refinement. The initial pre-visualization of shots provided the most intuitive assistance for script refinement, offering references for script concepts, facilitating communication and discussion among the entire production team and director, enabling timely adjustments and corrections, allowing the script to be formulated as completely as possible, and avoiding additional work due to understanding deviations later in the production process.

2.4 Environmental Lighting: Simulating Diffuse Reflection

Based on the above photo analysis and rational analysis of real lighting conditions, we established a set of target spotlights simulating skylight environmental lighting to simulate object diffuse reflection. This lighting setup consisted of three layers with a total of 24 lights, with light intensity decreasing from the horizon to the sky, and light source color transitioning from blue-white to blue-purple, aiming to create realistic lighting conditions formed by atmospheric reflection of sunlight.

After completing these two lighting groups, the lighting in the scene was already very similar to real lighting conditions. However, careful analysis of camera movement and the visual center subject revealed that the main archway in the visual presentation was in shadow, with the inscribed areas and areas under the roof too dark, requiring fill light to better shape the archway's outline. Therefore, we added a face light in front of the archway set to illuminate only the archway to compensate for insufficient light.

[Figure 3: see original paper] Final Rendering Result of Key Light and Environmental Light

2.5 Color Correction, Effects, and Compositing

In 3D animation production, not everything can be created in 3ds Max. After shot production, post-production software must be used for modifications, adjustments, or adding effects and compositing. Based on rendered output sequence frames, we imported them into After Effects to generate composites. According to director requirements, we used color correction for highlight, shadow, and mid-tone adjustments. Similarly, we could create effects based on shot needs. For example, setting the time as early morning, we could use fractal noise or After Effects plug-ins such as DF fog factory to create thin mist effects in the distance, simulating soft morning light and enhancing depth of field, making the scene appear to have better spatial dimension.

2.6 Non-linear Editing and Output

In the post-production workflow, there are two parts: the first part is the color correction, effects, and compositing mentioned above; the second part is editing. Editing involves using non-linear editing software such as Premiere to connect individual shots coherently, match them with appropriate voice-over, music, and sound effects, and add necessary transition effects, enabling the final complete output for television broadcast.

3. Using 3D Technology to Achieve Excellent Presentation in Program Production

The practical application process of digital technology in “Splendid Collection” program production and packaging has deeply convinced us of the undeniable role digital technology plays in television program production. Whether in pre-production shooting, post-production, or television signal storage and transmission, the changes digital technology has brought to the television production field are revolutionary, and the audio-visual enjoyment it brings to audiences is unprecedented. Although digital technology cannot replace traditional art, its impact on traditional art and its own development prospects are enormous. Practice has proven that such learning and attempts have not only provided “Splendid Collection” with high-starting-point production technology and cultivated a group of program production personnel adapted to new technologies, but more importantly, have ensured and improved the program’s quality and standards technically, achieving excellent results. This has played a tremendous role in creating this high-quality cultural program for Kunming Television Station. We believe that with theoretical research as a foundation, technological development as support, and talent as guarantee, digital technology will certainly have broad development prospects in the field of television program production.

References: [1] Luo Jun, Fan Dongyang. Television Channel Brand Marketing and Overall Packaging [M]. Beijing: China Radio and Television Press, 2003(10): 15-17. [2] Hu Zhifeng. Characteristics and Creation of Television Brands [J]. China Television, 2003(9). [3] Nicholas Abercrombie. Television and Society [M]. Nanjing: Nanjing University Press, 2002: 90.

(Author's Affiliation: Kunming Television Station)

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

Source: ChinaXiv — Machine translation. Verify with original.