

"Ben Ben Long" 3D IP Character Design and Development

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Abstract

With the vigorous development of the IP economy, cartoon characters with regional cultural characteristics have shown great application potential in the cultural and creative industry. This article takes the dinosaur culture of Zigong as the background and conducts research on the design and development process of the three-dimensional IP character "Ben Ben Long". By analyzing and drawing on the design concepts of successful IP characters from both domestic and international sources, a design style that is flat, has strong logos, and is cute and approachable was established. In terms of character shaping, combined with the iconic elements of the Zigong Dinosaur Museum, after multiple rounds of sketch iterations, the designs of the character's three views, color schemes, and nine types of professional clothing were completed. At the same time, logo design, expression package development, poster drawing, and 3D modeling and animation production were carried out around this character, achieving the transformation from two-dimensional vision to three-dimensional dynamics. This article systematically summarizes the complete process of the "Ben Ben Long" IP character from creative conception to implementation and development, explores the effective path of combining traditional cultural elements with modern design language, and provides practical references for the design and development of similar IP characters.

Keywords

IP image design; 3D modeling; Zigong dinosaur culture; Derivative product development; Emoticon design; Cultural and creative products.

1. Introduction

In recent years, with the vigorous development of the cultural and creative industries, the IP (Intellectual Property) economy has become a cultural phenomenon that attracts worldwide attention [1]. A successful IP character not only conveys cultural connotations but also maximizes its commercial value through diversified derivative development. China boasts abundant historical and cultural resources, and the unique regional cultures in various places provide rich soil for the development of IP characters. Zigong, as the "Land of Dinosaurs", has world-renowned dinosaur fossil sites and the Zigong Dinosaur Museum, offering natural advantages for creating a dinosaur-themed IP character. However, for a long time, dinosaurs in the public's perception have often been associated with labels such as "cold-blooded", "violent", and "ancient creatures", lacking appeal and modern aesthetic interests. How to transform the self-guaranteed dinosaur culture of Zigong into an IP character with market appeal has become a worthy design topic [2]. This research aims to take the dinosaur culture of Zigong as the core, design and develop a three-dimensional IP character named "Ben Ben Long". Through a systematic design process, create a dinosaur IP character with affinity, recognition, and cultural connotations. Explore the technical path for the transformation from two-dimensional graphic design to three-dimensional modeling and animation production to develop a series of derivative products, and verify the feasibility of the application of the IP character in cultural and creative products.

By reviewing the literature in fields such as IP image design, 3D animation production, and cultural and creative product development, we aim to understand the current research status and design trends both domestically and internationally, providing theoretical support for this design. We conduct in-depth analysis of representative IP images from both domestic and international sources, summarizing their design concepts, image characteristics, operation models, and success factors, and extracting design experiences that can be borrowed. Taking the "Ben Ben Long" IP image as the design subject, we carry out a full-process design practice from concept conception, sketch drawing, color setting, 3D modeling, animation production to derivative product development. Through the practice, we test the feasibility of the design scheme.

This research combines regional cultural elements with modern IP image design concepts, exploring the transformation path of traditional culture in contemporary visual language, and enriching and developing the theoretical system of IP image design [3]. Through the complete design and development of the "Ben Ben Long" IP image, a set of process experience from sketching, color setting, 3D modeling to derivative product production has been accumulated, which can provide practical references for design professional teaching in universities and product development in cultural and creative enterprises. Using the Chongqing dinosaur culture as a carrier, through the dissemination of the IP image, it enhances the public's cognition and identification of regional culture, and helps with the creative transformation and innovative development of local culture.

2. Design Process

2.1. Preliminary Planning

The design inspiration for the "Ben Ben Long" IP character mainly comes from two aspects. One is drawing on the successful IP design experiences from both domestic and international sources, and the other is the in-depth exploration of the local dinosaur cultural resources in Zigong. This study has set the design goal as creating an IP character of a dinosaur that also has the "clumsy and cute" characteristics and can evoke emotional resonance among the public. At the same time, Zigong is known as the "land of dinosaurs", with world-renowned dinosaur fossil sites and the Zigong Dinosaur Museum, which provides unique cultural resources for the development of dinosaur-themed IP characters. This study systematically sorted out the characteristic elements of the Zigong Dinosaur Museum. In particular, the sharp horn shape of the dinosaur at the entrance of the museum became an important design source for the horns of the "Ben Ben Long" character, making this IP character not only carry regional cultural memories but also achieve an aesthetic reconstruction of traditional dinosaur images through its cute design.

In terms of image positioning, "Ben Ben Long" has established the design principles of "flat, strong logo, and simple image". The proposal of these principles is based on the analysis and summary of the current popular IP image design trends. Through in-depth studies of successful IP images such as Pop Mart and Line Friends, it was found that these images generally have the common characteristics of simple shapes, bright colors, and high recognizability. Overly complex image designs not only increase the memory cost but also limit the flexibility of subsequent derivative development. In terms of style setting, "Ben Ben Long" pursues an aesthetic trait of "clumsy cuteness". The so-called "clumsy cuteness" refers to the image presenting a slightly clumsy but endearing state in terms of actions, expressions, and body posture. This trait can stimulate the viewer's protective desire and sense of closeness. In image design, "Ben Ben Long" consciously enhances the roundness of the body shape, the cuteness of the expression, and the awkwardness of the actions, making it visually presentable in line with modern aesthetic tastes while possessing a unique personality tag. At the same time, as an

IP image carrying the culture of Chongqing dinosaurs, " Ben Ben Long " does not simply cartoonize the dinosaur image, but rather, while retaining the basic features of dinosaurs, through the reconstruction of design language, realizes the organic integration of traditional cultural elements and modern design styles.

2.2. Process of Character Design

The design of the " Ben Ben Long " character image was not achieved in one go. Instead, it went through a series of iterative processes involving multiple sketches and repeated revisions. In the initial stage of the design, this study extensively collected and analyzed representative IP images available in the market. Successful cases such as Line Friends and Pop Mart provided important reference bases for the initial conception. These images generally shared the common characteristics of simple shapes, prominent features, and lively expressions. Thus, the basic direction of the " Ben Ben Long " design was established: while retaining the core features of a dinosaur, through exaggeration, simplification, and cute treatment, a friendly cartoon character was created. The head retained the typical structure of a dinosaur, and the horns at the back drew inspiration from the sharp horns of the dinosaurs at the entrance of the Zigong Dinosaur Museum, allowing the image to carry regional cultural memories. In terms of body handling, a slightly plump body design was adopted, combined with big, watery eyes and a little blush, making the entire image retain the dinosaur features while presenting an endearing and adorable overall temperament. The evolution process from the first version to the fourth version clearly demonstrated the gradual deepening of the design concept from realistic to cartoon, from complex to simple, and from general to distinctive, laying a solid foundation for subsequent color setting and costume design.

After the basic design of the character's appearance was determined, color design became a crucial step in endowing the character with vitality and distinctiveness. The color scheme for " Ben Ben Long " underwent numerous trials and adjustments, and finally, a color system was established with a main color of dark green, yellow for the abdomen, and orange-red for the cheek highlights. The selection of the main color is the primary task in color design. Dinosaurs are often associated with green in people's common perception, but the common grass green can easily make the image seem mundane and lack novelty. Considering this, this study chose a relatively fresh dark green as the main skin color for " Ben Ben Long ". Dark green has a higher brightness and moderate saturation compared to grass green, and visually gives a refreshing, lively, and comfortable feeling. It conforms to the color perception habits of dinosaurs and achieves differentiation from ordinary dinosaur images through subtle adjustments of hue. The yellow on the abdomen contrasts sharply with other skin colors, enriching the color hierarchy and enhancing the visual impact of the image. The orange-red cheek highlights are the finishing touch for the " Ben Ben Long " image, and this color element adds a touch of cuteness and friendliness to the image, becoming an important memory point of the image. Additionally, a single image is difficult to support the long-term operation and diversified development of an IP. Therefore, " Ben Ben Long " was designed with a series of different occupational and scene-specific clothing variations beyond the basic image. These clothing designs expand the application scope of the image and achieve the organic integration of traditional culture and modern trends through the language of clothing. After the static image design was completed, how to make " Ben Ben Long " display vitality in dissemination and application became the next issue to be addressed. Emojis, as a popular cultural phenomenon, rely on the continuous development of social media and the internet, and have become an important medium for people's daily communication. They are also an important way for IP images to enhance vitality and expand dissemination. Based on this understanding, this study designed and developed six commonly used emojis for " Ben Ben Long ", giving the originally stiff two-dimensional image rich emotional expressions.

2.3. Logo and Visual Identity System Design

The logo, as the core element of the visual identification system of an IP image, performs multiple functions such as brand recognition, information dissemination, and visual uniformity. In the design process of the "Ben Ben Long" IP image, the logo design is placed at an equally important position as the character image, aiming to create a visual symbol that matches the character image, can be independently disseminated, and is interesting. The core concept of logo design is centered around the name "Bepinlong". Through the transformation of visual language, the pronunciation characteristics of the name are integrated with the image features of the character, forming a logo graphic that is both simple and memorable and full of fun. Posters, as the comprehensive application form of the visual identification system in the communication scenarios, are not only important carriers for testing the visual expressiveness of the logo and the character, but also effective media for building public recognition of the IP image. In the practice of "Ben Ben Long" IP image poster design, the research team took exhibition display as the application scenario, with the dual goals of disseminating information and shaping the image, and designed and produced three different themes and styles of poster works, systematically exploring the application paths of the visual identification system in specific communication practices.

2.4. 3D Modeling and Animation Implementation

The establishment of the two-dimensional visual image laid the visual foundation for the dissemination of the "Ben Ben Long" IP character. However, static planar images are unable to fully showcase the three-dimensional features and dynamic charm of the character. The introduction of 3D modeling and animation production not only achieved the spatial transformation of the image from two-dimensional to three-dimensional, but also endowed the character with more vivid vitality and emotional tension through stereoscopic presentation and dynamic expression. In the 3D modeling stage, the research team precisely restored the morphological characteristics of the character using polygon modeling technology and optimized the topology structure according to the animation requirements, achieving the organic integration of two-dimensional aesthetics and three-dimensional space. In the material and rendering processing, through the precise control of UV mapping, subsurface scattering materials, and three-lighting schemes, the color system, texture expression, and lighting effects were ensured to be highly unified. At the scene construction level, based on the four narrative themes of space exploration, daily life, ideal home, and character origin, immersive three-dimensional scenes were constructed, expanding the narrative dimension and imagination space of the character. In the animation design stage, based on the character's "clumsy cute" personality positioning, techniques such as expression fusion deformation and action rhythm control were used to give the image a vivid emotional expression and life tension [4]. The practice of this chapter shows that the intervention of 3D technology not only achieved the qualitative change of the image from static symbol to dynamic character, but also laid a digital asset foundation for the dissemination application and derivative development of the IP character, providing a systematic technical reference for similar design projects from two-dimensional to three-dimensional transformation.

2.5. Derivatives Design and Development

A systematic discussion on the derivative design and application of the "Ben Ben Long" IP image has been presented, covering three dimensions: planar derivative products, physical products, and exhibition dissemination. This comprehensive exploration delves into the practical paths of IP image application in cultural and creative products [5]. In the development of planar derivative products, the research team designed rounded cards and six dynamic emoticons. The cards were simply interpreted to showcase the characteristics of each character role through the combination of numbers and logos, possessing both promotional and

commemorative functions. The emoticons, leveraging the dissemination characteristics of social media, endowed the static images with emotional vitality, laying the foundation for subsequent peripheral extensions. At the level of physical product development, the research team selected items such as throw pillows, badges, and phone cases for customized production. The throw pillows featured four characters with better images to highlight a cute style, the badges creatively combined emoticons with different clothing and headwear, and the phone cases directly applied poster designs for visual transformation. Additionally, the research team also attempted the manual production of stone plastic clay figurines, although it did not fully achieve the expected results, it expanded the boundaries of design thinking and skills in the exploration of cross-border craftsmanship. In the exhibition dissemination aspect, the research team systematically arranged visual materials such as illustrations, posters, and cards, presenting them through display boards, achieving the dissemination effect of the IP image from design drafts to physical objects, from single products to overall presentation. The practice in this chapter indicates that derivative design is not only an important way to transform the commercial value of the IP image, but also an effective means to test the extensibility and adaptability of the image. Through diversified product carriers and application scenarios, the IP connotation of " Ben Ben Long " has been enriched, the dissemination scope has been expanded, providing a practical case for reference for the derivative development of similar cultural and creative IP.

3. Summary

This study systematically summarizes and provides a forward-looking perspective on the overall research on the three-dimensional IP image design and development of " Ben Ben Long ". The research shows that this project is based on the Chongqing dinosaur culture and successfully created the IP image of " Ben Ben Long ", which combines regional cultural characteristics with modern aesthetic qualities. In terms of image positioning, it has transformed from the traditional perception of "cold-blooded violence" of dinosaurs to an "adorable" friendly image. In terms of design methods, it has explored a feasible path combining flat style with 3D technology. In terms of application development, it has constructed a complete industrial chain from planar vision, 3D animation to physical derivative products. Through multiple iterations of the character image, scientific setting of the color system, diverse integration of clothing culture, interesting construction of logo symbols, three-dimensional technology's three-dimensional transformation, and diverse development of cultural products, a set of replicable and promotable IP image design and development process has been formed, providing theoretical and practical references for the creation of similar regional cultural IPs. However, during the research process, several issues worthy of reflection were also exposed: the production effect of the stone plastic clay figurines did not meet expectations, reflecting the need to strengthen the connection between manual craftsmanship and digital design; the development of derivatives is diverse, but there is still room for improvement in product seriesization and brand systematization; the subsequent operation and market promotion strategies of the IP image have not been deeply explored. Looking forward to the future, the further development of the " Ben Ben Long " IP image can focus on the following aspects: first, deepen the exploration and expression of cultural connotations, integrate more local cultural elements into the image narrative to enhance the cultural depth and recognition of the IP; second, improve the product system and brand building, expand market influence through series development and joint cooperation; third, explore the deep integration of digital technology and IP images, such as the development of emerging application scenarios like augmented reality and virtual idols; fourth, build a long-term operation mechanism, through continuous content output and fan community operation, achieve sustainable growth of IP value. The design and development practice of " Ben Ben Long " prove that the creative

transformation of regional culture and the innovative development of IP images complement each other. Only by deeply embedding in the cultural root, conforming to contemporary aesthetics, and embracing technological changes can high-quality IP images with cultural warmth and market vitality be created.

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