Application of Narration in QR Code Image Design

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Abstract: Narrative design was originated in the 20th century. As a kind of design thinking, it runs through various fields such as architecture, environment, and new media. The QR code design has gradually become a bridge for media integration design, and its importance is becoming increasingly obvious. An optimized QR code design may gradually replace the original LOGO of certain goods or brand. In this study, narration is embedded into the QR code design, and a new QR code design image is gradually constructed through three ways of planarization, spatialization, and narration.

Keywords: Narration; QR code image; Design optimization

1. Overview of QR code background
1.1. Technical principle of QR code
The technical principle of QR code was originated from weapons and equipment management of the United State (US) military in the 1980s. The concept was loved by the US military at that time for its convenience and fast use [1]. In 1990s, the QR code was introduced by the Ministry of Railways to Japan as the foreground of the personal information system in the field of train ticket recognition, and gradually applied the similar concept to the urban traffic construction system [2]. In 2011, with the rise of smart phones, WeChat, Taobao, Alipay, and other application (APPSappeared in large numbers, gradually enriching the use of QR code carriers. With the technical progress of the QR code, it has gradually become a new favorite technology in social networking, mobile payment, urban construction, and other fields. The data block of QR code can be simplified to 40% of the original, without hindering the daily use of QR code graphics, and ensuring the basic use of its function.

1.2. QR code design limitations
The limitation of the QR code design stems from its poor recognition ability. A QR code is a binary propagation code, and requires two different data symbols to identify. From the design point of view, the color contrast of the QR code should be strong, therefore the color used in the QR code design is mostly black and white, red and blue, green and purple, and other combination colors. To meet the requirement of rapid identification, the same QR code can't appear three colors to ensure the safety and reliability of identification. A QR code is composed of dozens of blocks, and each block needs to be color-filled in the design [3]. The design must transform and fill the original QR code, and the proportion of color filled in each small block must exceed 60% to ensure the scientific and readable identification. According to the

analysis of the basic attributes of the QR code design, the QR code is read by four locating eyes, and the blank area beside the four locating eyes should be designed according to the original QR code [4].

1.3. QR code application propagation

In the decade of mobile Internet, QR code has gradually become a necessary commodity for people's life, and plays an important role in urban construction, transportation, Internet commerce, and other fields. The number of QR code scanning is 223.3 billion times a year, and approximately 612 million times in a day, which is closely related to the whole society. At present, the spread of QR code is mainly divided into the following aspects: [5] (1) Mobile payment. As the foreground of mobile payment, QR code serves as a bridge between consumers and sellers for mobile payment, and constantly optimizes and realizes the high security of mobile delivery; (2) In terms of brand promotion, in the 1980s, the concept of logo design was gradually introduced into China as a concept of brand design [6]. The rise of QR code gradually divided the brand logo into online and offline modules. The offline logo is mainly used to carry the cultural and ideological connotation of the brand, and QR codes are mainly used online, but due to design defects the QR codes are still dominated by black and white modeling [7]; And (3) In terms of cultural communication, the current QR code design bears the needs of cultural communication, especially the reports of foreign media, which regard China's QR code graphics as the symbol of industry, science and technology, and communication 5.0.

2. Narrative design theory

2.1. Narrative design principle

The proposition of narration originated from French structuralism, in the 20th century, which was proposed as an individual of nature, the behavior of listening to stories, and telling stories is a talent endowed by nature. In 1966, Nonette, Todorov, Blaemon, and other authors made relevant statements on narrative thinking in the French magazine "Exchange," focusing on the literary creation, space design, and other aspects of narration, and formed relevant systematic statements. Gerrard a narratologist believes that the principle of narrative design should conform to three lines [8]. Firstly, time is targeted by advancing in a certain direction as a whole, secondly, events have conflicts, which will stimulate the desire and demand of the audience or readers. Lastly, the plot is interesting. Through the immersive way of expression, readers can feel the ideas of the designer or producer in a short period of time.

2.2. Current condition of narrative design

Narrative design In China and abroad has achieved remarkable results in terms of theoretical exploration, practical application, etc. [9] Narrative design in foreign countries, mainly exists in literary works, especially in stage play performance, early childhood education, and other aspects. By presenting stories on the platform, on one hand it beautifies the appearance of narrative design through diversified design methods such as modeling design, material design, color design, etc. [10] On the other hand, it improves the interest and impact of the story, builds a better and more ritualistic narrative story, and integrates the narrative design and narrative story perfectly to complete a better narrative sensory experience.

2.3. Narrative QR code concept

In the narrative nature of the QR code, the original single dimension is spread to multiple dimensions. By building a virtual space, the relationship between subject and object is closer, and the relationship between QR code and audience is built in the shortest time [11]. Narrative QR code designers should use small scenes to form short stories about the content of the QR code in 3-5 seconds for the audience to understand, and to make them feel the cultural, emotional, and knowledge implications behind the images. The visual

experience can be improved through the design of language scenarios to meet the need for creators to express graphic connotation more richly when designing QR codes. Moreover, the narrative QR code design can help readers to feel the story behind the black and white QR codes through images, and integrate information into the overall sensory system, analyze, and understand it, [12] to truly bring the audience to a graphic narrative world, and let the audience feel the meaning of the story.

3. QR code design strategy based on narrative thinking

3.1. Planar narrative QR code design research

The planar narrative QR code is designed and developed by using QR code to read dark and light colors, and the original black and white QR code is replaced by color, graphics, and other methods. The first step is to improve the QR code itself, and further optimize the design of the QR code by reducing the redundant and unnecessary data points and rotating the QR code energy mode [13]. Then, an element list is built and replace with different types of QR code black and white data blocks with color plane elements, comprehensively replace them according to the 75% coverage principle, and replace the elements of the positioning box, to ensure the availability of the QR code.

Figure 1. Planar narrative QR code design

Taking the QR code design of Fox's shop as an example (as shown in **Figure 1**), Fox's shop is a shop mainly producing yogurt and dairy products, focusing on the service concept of being close to nature and feeling nature [14]. In the process of narrative QR code design, natural animals, natural landscapes, and other elements are replaced, and six different elements respectively corresponding to each other, such as leaves, trees, and animal heads, are replaced to ensure the fun and story of the design. At the same time, the four positioning boxes are used to ensure the coverage rate of their data points reaches more than 80%, and the light color is replaced with the white data point, making good use of the contrast between the light and dark color. The advantage of the planar narrative QR code is that it can be designed and constructed quickly for simple narrative scenes with a strong sense of intuition [15], while the disadvantages is that the construction of the scene is not strong enough and the interest is weak.

3.2. Spatial narrative QR code design research

Spatial narrative QR code design is 3D, QR code, hoping to complete the overall QR code design by building a 3D narrative scene [16]. The first step is that the fault tolerance rate of the spatialized QR code is low due to deformation, transformation, and other reasons, therefore the QR code must be designed completely. In addition, the QR code data block should be converted into 70-degree or 60-degree original QR code data to facilitate data reading [17]. The second step is to design the four locators. The data origin can be built by using building, landscape, and other elements to ensure the smooth reading, and replacement of the other data points of the QR code.

Figure 2. Spatial narrative QR code design

Taking the QR code design of the "Fish Rice" as an example (as shown in **Figure 2**), "Fish Rice" is a restaurant for entertainment and leisure. It adheres to the concept of pure natural production, pays attention to fresh food materials and decoration trends, and is popular among the younger generation. Firstly, the original QR code is transformed into a fishing scene of "fish eating rice", and the overall narrative scene is made [18]. Secondly, the leisure buildings are built on the three positioning frames by using lounge chairs and rest places as design elements, and the lake as the design platform in the main scene of the QR code to build a bridge between the QR code and the brand. Finally, hot air balloon, sun, cloud, and other elements are added to the overall scene.

3.3. Scene-based narrative QR code design research
The scene-based narrative QR code design mainly follows the story script as the design thread with the core idea of "what are you doing?", which are written according to the three main elements of characters, places, and stories [19]. The scene-based QR code design is different from the scene cutting of the QR code itself, which is focused on the planarization and spatialization. Different narrative rooms are constructed, and the overall scene-based narrative QR code design is gradually filled.

Figure 3. Scene-based narrative QR code design

Taking the QR code design of the Suzhou University Graduate School as an example (as shown in **Figure 3**), in the context of scene-based narrative QR code design, the first step is to prepare the scene. Designers can use a QR code as a house, followed by cutting the QR code into several rooms of a house, subsequently design different stories in different rooms. The second step is positioning design. It is difficult to design the positioning frame of the scene-based narrative QR code design. Starting from the positioning frame, as the school doorplate of Suzhou University, the stone lion is used to optimize the design of the scene at the entrance, to ensure the integrity of the design of the gate [20]. The third step is local design. For the rooms that are divided in the early stage, local design will be conducted, and the theme in each area will

be replanned. For example, in the dormitory scene, it is possible to restore the upper and lower bunks of college students' dormitory, and the reading space to restore the scene of book borrowing.

4. Summary

As the "final mile" of mobile Internet, QR code plays a key role in mobile payment, brand marketing, and other important fields. As an important concept of narrative QR code design, on the basis of satisfying the use of QR code, it can broaden the space dimension of QR code design, truly integrate stories into the design, and endow the original black and white QR code with interesting "soul" color.

Disclosure statement

The author declares no conflict of interest.

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