

Application of QR Code in Small Art Exhibition

Taking the Exhibition of Intangible Cultural Heritage Overseas as an Example

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Abstract—With the rapid development of information technology and mobile intelligent terminal, QR Code is more and more widely used. QR Code has the features of high information density, large data storage capacity, strong error-correcting ability and good secrecy, it can be used not only to identify objects, but also to describe them. At present, the use of QR Code is very popular in China, and the recognition program is relatively perfect, especially in mobile devices is very convenient, so two-dimensional bar code recognition has become a hot research direction and application field. Because the intangible cultural heritage is an important cultural treasure in our country, it has also become a vital part of our cultural undertakings to let these intangible cultural heritages go out. The combination of the application of QR Code and the intangible cultural heritage exhibition is also a new way of exhibition. The development of this form of exhibition is designed to meet the current application gap of QR Code in art exhibitions, which is a new attempt for the application of QR Code in mobile devices, and also is an exploration of the application prospect of QR Code. There are some visitors in the exhibition who are interested in the application mode of QR Code's intervention, so the use of bar code recognition system caters to the needs of some potential visitors who need QR Code's intervention to view the exhibition. At the same time, it also promotes visitors' desire to purchase.

Keywords—QR Code; intangible cultural heritage; art exhibition

I. INTRODUCTION

QR Code (Quick Response Code) is a kind of matrix bar code that is an optically machine-readable label, and if installed into a project, it can record all the relevant data and information about the project. Its geometric construction determines that it has numerous advantages in information storage, including large information capacity (can store images and videos), secure and encrypted, simple production etc. What's more, its recognition which is different from one-dimensional bar code recognition does not require special equipment, and does not need to use dedicated scanning reader connected to the computer. However, the main recognition device for QR Code is the smart phone terminal. When you use it, you just need to turn on the smart phone camera and scan the recognition area, which the stored digital information can be displayed on the mobile phone. If necessary, you can also connect the Internet to watch the corresponding images, videos and other data contents.

In addition, QR Code's ability to damage-resistance is strong, and the correct information stored in QR Code can still be recognized even if the damaged area reaches 40 percent. An ordinary QR code is a square mesh set on a white background by a black module (square dot). The "Fig. 1" shows the QR Code recognition code template. The QR Code consists of four major parts:

- Red parts mark the formatted information.
- Blue parts mark the version information.
- Gray parts mark data and error correction value.
- Both black and white lines mark the required mode.

Both black and white lines mark time.

The black dot squares in the middle mark alignment.

The black squares of the three corners mark the position.

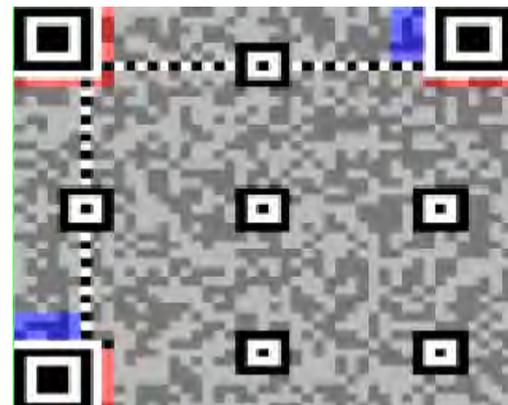


Fig. 1. QR Code recognition code template.

II. APPLICATION AND DEVELOPMENT OF QR CODE AT HOME AND ABROAD

Our country has already introduced the application of QR Code as early as 2006. Because at that time the smart phone has not been popularized coupled with the relatively slow development of network platform, this new way of using QR Code has not been truly popularized. Due to QR Code must rely on mobile terminal platform, so it can only be used on relatively advanced smart phones. With the popularity of the new generation of mobile phone applications such as WeChat and Alipay, the "RichScan" function has promoted the

production of all kinds of QR Code. More and more businesses, from food and drink to beauty and from travel to shopping, through the form of scanning the QR Code to give consumers certain of consumption preferences and then to gain the favor of consumers, which can absorb a large amount of personal information and data and consuming habit of consuming groups.

Usually the QR Code that we see and most software generated is black, but in fact the colorful QR Code generation technology is not complicated, and it is very popular among young people. So some websites have started to provide free colorful QR Code online generation services.

Because QR Code has the features of large amount of storing information and small volume, its application in traditional papers and media with the smallest volume can extend and expand the information and data infinitely to the maximum extent. The exhibited mode of QR Code's intervention in the art museum has been widely popularized overseas. Most of the important museums or representative art museums have completed a new form of exhibition combined with the QR Code exhibition. One of the great pleasures of visitors who visit the exhibition is scanning the QR Code of the related exhibits. This form of scanning QR Code with a mobile phone can deliver detailed information to visitors about various kinds of exhibits, while it can also provide audios, videos and other forms of multimedia content. Visitors can not only learn about the related exhibited works themselves, but also take their favorite exhibit information home and share it with their friends by scanning QR Code.

However in domestic museums or art galleries, the form of scanning QR Code to learn about exhibits is less popular, and the exhibition information available to visitors is much less impressive. Some large exhibition institutions, such as the National Museum, the National Art Museum of China, and the Shanghai Museum, are still using interpretation devices, written texts, on-site explanations by a full-time person and other traditional forms to provide interpretation and guidance for visitors. If the number of visitors is less, the traditional way of guided tours is practical and effective. However it is a large or professional exhibition with a large number of visitors, and a large number of them enter the exhibition halls at the same time. Moreover, the demand for guided tours is enormous, so the traditional forms of text display and live human interpretation have failed to serve the large number of visitors. As for professional exhibitions, the interpreters with limited knowledge reserve cannot grasp a large number of data and professional knowledge in a short time, which will make the experts and visitors can not quickly and effectively obtain the exhibition information so that their visited experience will be reduced. Although some exhibitions also more or less use the guided tours form of QR Code's intervention, but because this way is not enough popular in China, the relevant personnel operation is not professional enough, and in some exhibitions there only are a few dozens of characters in contents linked by QR Code. This not only has reduced the efficient broadcast of the guided tours form to a dispensable embarrassing situation, but also completely misinterpreted the original meaning of the use of QR Code guided tours.

III. THE INTANGIBLE CULTURAL HERITAGE

According to UNESCO's Convention for the Protection of Intangible Cultural Heritage, Intangible Cultural Heritage is defined as the various practices, performances, performance patterns, knowledge hierarchies and skills and related tools, objects, handiwork and cultural places etc. that are regarded as cultural heritage by various populations, groups and sometimes individuals.

The "intangible cultural heritage" defined in the Convention includes the following aspects:

- Oral traditions and performance patterns, including language as a medium of intangible cultural heritage.
- The performing arts.
- Social practices, rituals, festival activities.
- The knowledge and practice of the nature and the universe.
- Traditional crafts.
- Other intangible cultural heritage.

With the mutual relationship between their living environment and the nature, and the continuous accumulation of historical conditions, these populations and groups will re-created this kind of intangible cultural heritage handed down from generation to generation. At the same time, they also have a sense of identity and historical responsibility, which promotes the cultural diversity of the nation and stimulates the creativity of mankind.

IV. COMBINATION OF INTANGIBLE CULTURAL HERITAGE ART EXHIBITION AND QR CODE

The artwork system based on QR Code combines the smart phones, mobile Internet technology and the information management of artworks, and then realizes the mobile and portable management of artworks by using QR CODE to integrate the information and data of works. In particular, after the full use of smart phone camera equipment, we can not only achieve the collection of information, but also can conduct live-action display of artworks, and for the expensive value and mobile inconvenient artworks, it can also meet the requirements of multimedia information management to the greatest extent.

Since intangible cultural artworks are characterized by little variability, this form of exhibition can be used for many times. A time of production can be used for a long time, and as long as before each exhibition abroad, the language and words need to be changed into the mother tongue of the corresponding country. Due to the nature of the exhibition, the personal allocation is relatively inadequate in exhibitions overseas. Besides exhibition artists, there are only one or two staffs as accompanist in most cases. Because of the language problem, the artists who are taking part in the exhibition are unable to answer the questions raised by the visitors in the first place. So for such understaffed small exhibitions, QR Code's intervention appears more crucial.

Taking the exhibition of intangible cultural heritage in New Zealand this time as an example, we place a premade QR Code next to the important intangible cultural heritage exhibits, whose contents include the text brief of the exhibited works (bilingual contrast between Chinese and English), the picture analysis of the work production process, a three-minute short film explained by the author (with subtitles), a post bar on an interactive website (with the function of automatic translation) and others. Each visitor (especially the foreign audience) can understand and watch his or her favorite exhibited works at any time and place without having to be equipped with a special person to explain the works, and the visitor can scan the code first to learn more information about the exhibited works and the artists who are taking part in the exhibition. The visitors should have a basic concept through their understanding of the works, they can go to ask the exhibition staffs when they want to know more about their favorite artworks. As a result, staffs will have ample time to answer questions arising from visitors who already have an initial concept of the artworks, and in some cases a significant number of visitors will decide to purchase the artworks without asking the staffs, or they leave on their own. This not only reduces the workload of the staffs, but also gives them a time difference to answer questions proposed from different audiences.

In the whole process of viewing the exhibition, the QR Code's intervention can not only improve the experience and feeling of visitors to watch the exhibition, but also enhance their desire to buy the exhibited artworks. At the same time, the frequency of inquiry about artworks that do not have a QR Code is significantly lower, with only a small number of visitors expressing their interests in such objects. While most of the audiences simply give a hurried and cursory glance at them, not to mention their desire to buy. So it is not difficult to see that the intangible cultural heritage exhibition through the intervention of QR Code can have the following advantages:

First: by applying QR Code to an exhibition of intangible cultural heritage, the visitors will not only be able to understand the content of the artworks. At the same time, they can understand the intangible cultural heritage how to carry forward people's creative background, connotation, work ideas etc. and other related artwork information, which can not only deepen the audience's impression and their cognitive interests, but also increase the extent of information extension and expansion of intangible cultural heritage.

Second, the production cost of QR Code is generally low and it is very convenient to make, and only the corresponding mobile network need to be provided when we use it. Anyone can understand the information about the exhibition of intangible cultural heritage through QR Code. This way not only broadens the scope of the artwork dissemination, but also is not restricted by distance.

Third, the popularity of the network has created a great space for the development of QR Code. And only with the network and smart phones, you can use QR Code to operate, which can not only obtain the relevant information of the intangible cultural heritage exhibition. At the same time, it spreads faster and has strong autonomy so as to avoid the

negative effects brought by the compulsory means of communication.

V. CONCLUSION

To sum up, the QR Code's intervention has played a positive role in the promotion of intangible cultural heritage exhibitions. Especially in foreign countries where the environment and culture are relatively unfamiliar to us, QR Code is not only able to quickly and conveniently transmit the exhibition information of the relevant works to the exhibition attendees. At the same time, it also shortens the distance between visitors and artworks and reduces the information communication barriers caused by different languages and characters, which strengthens the cultural identity among one another.

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