Research on Holographic and Digital Protection of Cultural Heritage Information

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ABSTRACT: International cultural heritage protection theory and practice from the independent type of "information" to the series of "information", and extend from "tangible" to "intangible". The informations of cultural heritage protection are more complete and the methods are more holistic. Using holographic 3D digital technology can better realize the cultural heritage information integrity protection. This approach will enable the visual language to multi extensions and the sensory experience to multi-dimensions. Dissemination of cultural heritage will be digital, cross media, interactive mode.

KEYWORD: holographic; digital; cultural heritage information; integrity

1 INTEGRITY OF CULTURAL HERITAGE PROTECTION

1.1 The Theory and Practice of the Development of Cultural Heritage Protection

Once UNESCO "The Declaration of World Cultural Diversity" has proposed that the common human historical and cultural heritage has different forms in different times and places, showing the diversity of culture. The essence of the cultural heritage protection is the process of people' attention on a level or multiple levels of its value and showing by behavior, retaining its value display. Cultural heritage protection theory and methods are centered and expanded on how to make the maintenance and use of heritage values. And the scope and quality of the cultural heritage protection activity is often determined by certain social leading values.

The concept of international cultural heritage protection with the development of cultural heritage protection practice simultaneously. After twentieth Century 30's the modern cultural heritage protection theory began to form, and because of "International Charter", "the Convention" promulgated and becoming more detailed and perfect. Overall, the development of international cultural heritage protection theory after twentieth Century 30's can be divided into three stages: Between twentieth Century 30's to 60's, established the monument protection principle and formed the concept of historical and environmental protection; Between 70's to 80's, established the holistic approach of historical environmental protection; 90's up to now, has established the conservation and management of heritage and its dynamic environment concept.

1.2 Integrity Protection of Cultural Heritage.

Looking over the domestic and foreign development of cultural heritage protection theory and practice can be seen on steering characteristics of the field: cultural heritage protection from the independent type of "information" to the series of "information", from the "tangible" information protection extended to "intangible". Cultural heritage informations are more complete and protection methods are more holistic.

The traditional cultural heritage protection is focus on how the real example of "certain information" is protected and inherited. However, there have all kinds of connections with the change of dynasties, multi culture fusion, and multi ethnic distribution in cultural heritage, these cultural heritages can be used as a series of cultural "information" to protect. The traditional cultural heritage protection method generally attach importance to the protection of "tangible" information, such as temperature, humidity and other physical environmental setting, it effectively protect the physical level of "cultural relics". In addition to the material informations it also includes history, art (aesthetic), science and technology, thought and other aspects of the information. How to improve these aspects which are in addition to the protection of material informations is a new subject in this field. Cultural heritage is co existence with certain

environment. The most important of intangible heritage protection is the protection of historical information. Cultural heritage includes the physical environment, historical environment and other informations. Single cultural relic building represents "dominant characters" of historical informations are limited. Many informations contained in the morphology and structure of the environment even in the monuments around the city's landscape. To restore panorama landscape of cultural heritage needs the environment, block, city all around.

Cultural heritage "information" expansion and integrity protection mode can be realized only through various protection technologies, policies, regulations and education efforts. Therefore, compared with the protection method solely focus on material entity we must consider all aspects of the economic, political, social, cultural factors at present. Reusing cultural resources that to continue social function and characteristics of heritage sites, to maintain the stability and development of the local social structure and traditional way of life. In addition, new technology protection that from communication perspective and is the use of modern digital holography, network technology, computer, mobile phone, with digital receiving equipment for terminal information dissemination of new media. It has interactive, initiative, individuality characteristic and so on. Today information highly developed, a variety of new media technologies are playing an more and more important role to social development, and for the protection of cultural heritage its effect can not be ignored.

2 HOLOGRAPHIC CULTURAL HERITAGE PROTECTION

2.1 *Holography and Holographic Language.*

"Holographic" is a concept which is proposed in 1948 after the physicist Gerber and Rodgers invented optical holography, namely the holographic recording and reconstruction of optical wave front. Holography is the technology of a three-dimensional image recording and reproducing called the image hologram. Holography and photography are different. Holography is not reflecting the "image" but the object light wave even if the object no longer exists, but as long as lighting this record can make the original object "reproduction". Hologram reserves a large amount of information that can appear all. In addition to the technical level of "holographic", in the level of theory and way of thinking the concept of general holography is more known as a system. Holographic epistemology as understanding of emerging disciplines in the field, its definition is about: theory of all-round, multi angle study between subject and object relations at the same time.

2.2 *Holographic Cultural Heritage Protection.*

Holographic cultural heritage protection refers to the use of holographic imaging technology, contemporary mapping and remote sensing, computer virtual reality technology. Tangible and intangible cultural heritage information truly and completely store to the computer network in form of holographic digital, also achieve the holographic 3D database for the protection, restoration, display, communication.

As mentioned before, the tendency of integrity of modern cultural heritage protection needs the cultural heritage from the independent type "information" to the series of "information", and from tangible" extended to "intangible" information. In order to achieve the integrity protection, using holographic 3D digital technology can better realize the cultural heritage information integrity, and making up the defects of traditional culture heritage protection method. First of all, the holographic 3D digital heritage entities through image data acquisition methods, or establish a kind of 3D or model database, which is an important resource of preserving the type of data and spatial relationship of cultural heritage. It is the realization of science, high precision and permanent preservation of endangered heritage resources; Secondly, using these techniques to improve the accuracy and pre judgment of heritage restoration, selection of protection methods to be adopted, also the repair cycle can be shorten; Once again, to integrate a wide range of heritage resources through the computer network, and through the network in a large range by using virtual technology can be more comprehensive, vivid, vivid display of heritage. The heritage from the geographical restrictions so as to realize the sharing of resources, and truly become the whole mankind can "own" historical and cultural heritage.

The holographic digital of historical and cultural heritage is not only the foundation of the sustainable development of information industry and cultural industry, but also is an important measure of improving the comprehensive national strength and constructing the advanced culture. The economic and social significance of this work is extremely far-reaching. However, to realize the cultural heritage of holographic 3D digital protection, inheritance, development and tourism utilization, there are specific requirements in the protection: First of all to make intangible culture tangible and situational; Adopting auxiliary carriers that architecture, art, culture symbol, props, containers, materials and so on, also using the zoom, mutation, grafting, combined, cartoon and other techniques to cure some cultural characteristics, which make the

intangible culture tangible scene; Secondly, the cultural resources need to be subjective and intensive. The general cultural tourism resources are dispersed distribution and homogeneity phenomenon. In the development of cultural tourism polymerization of resources need to take in principal and intensive means. Through the transplant, borrowing strength, grafting and other means, to achieve the optimal allocation of resources and integration; Finally, to achieve cultural resource is not subject to geographical restrictions, and protect and inherit healthly, stably, sustainably.

3 CHARACTERISTICS OF HOLOGRAPHIC CULTURAL HERITAGE

3.1 *An Extended Multidimensional Visual Language*

In the protection of holographic cultural heritage, designers can use multidimensional and multivisual language expression to combine the various visual elements in a variety of cultural heritage together, which generate a morphology of two-dimensional, three-dimensional, and dynamic three-dimensional holographic image. The use of "light" effect, the acoustic stimulation and multi sensory stimulation, which vividly express the material and immaterial information of cultural heritage to drive audience's mood, so as to achieve more effective communication.

3.2 *Multi Sensory Experiences of Comprehensive*

In addition to visual design sound is also an important element in cultural heritage protection works. The choice of audio can foil or change the atmosphere. A set of dynamic visual elements of the same with two different audio mix, produced effect may be exactly the opposite. The sound can endue work with a new life. When the dynamic structure of sound rhythm and the picture of the resonance occur, the effect can excite people's mind. Then the integrity protection of cultural heritage can be expressed adequately. In addition, combine with the characteristics of cultural heritage, holographic digital can also excite the audience's touch, taste sensory stimulation, that to achieve the comprehensive effect of multi sensory experience.

3.3 *Propagation of Digital Cultural Heritage*

Cultural heritage of traditional mode of transmission is generally printed matter, so that not only spend a lot of manpower and material resources, but also lags behind in terms of timeliness. Dissemination of holographic cultural heritage will realize digital communication. Digital information has the characteristics of diversity, information flow of infinity, wide spread etc.. Using of computers, digital cameras and other equipment to gather text, data, audio, video and other information together which form the comprehensive performance of audio-visual integration. Holographic digital infinite in quantity and nonlinear characteristics of its technology has changed people's traditional step-by-step information acquisition mode. It has a more flexible and humane way of presenting to audiences, to achieve effective dissemination of cultural heritage. The range of digital communication can be infinitely extended to every corner of the world. The information superhighway as the core of holographic digital processing mode and communication will comprehensively improve the people's cognitive ability and creative ability.

3.4 *The Realization of Cross Media Communication*

Holographic cultural heritage media integrated media advantages that get a good audio-visual effect and having the characteristics of real-time, dynamic, and interactive. The text, sound, picture, color, animation, music, image, three-dimensional space elements are combined, which realize the comprehensive spread across media, satisfy the audience's psychology of seeking new, and strengthen the effectiveness of information dissemination.

3.5 *Acceptance of Interactive Experience*

Interactivity is one of the main characteristics of holographic heritage protection. Compared with one-way propagation mode of traditional media, interactive way gives audiences more power to choose. The status of audience has changed from passive recipients of information to select information actively. Audience can actively participate in the dissemination of information, and enhance the ability and choice of the audience. In addition to accept information, the audience can also take the initiative to feedback and according to their own preferences to capture text, picture, sound, images and other information. Also to spread their attention information via the Internet, then make the mode of propagation of cultural heritage information presentation three-dimensional. Of course, this new interactive way will make audience's cognitive psychology and aesthetic psychology change relevantly and this change in turn on holographic method of cultural heritage put forward new demands.

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