

An Exploration of the Development Approach of Art Galleries in Guangdong-Hong Kong-Macao Greater Bay Area in the Age of Artificial Intelligence

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ABSTRACT

According to the *Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (GBA)* issued by the Communist Party of China Central Committee and the State Council, various cultural resources in GBA should be fully exploited for the construction of a Humanistic Bay Area (HBA). In this context, art gallery as a public facility for art display and cultural inheritance plays an irreplaceable role in cultural exchange and aesthetic education. This paper starts with the basic functions of art gallery like collection and exhibition, followed by the successful experience of other bay areas in the world. On this basis, it attempts to explore the chances and dilemmas of the intelligentization of art galleries in GBA with the assistance of new technologies including the Internet of Things, big data, and cloud computing. Besides, it would put forward corresponding strategies in view of an intelligent ecology of art galleries, hoping to transform it into the most dynamic and creative link in HBA.

Keywords: *Art galleries; Artificial Intelligence; Humanistic Bay Area*

1. INTRODUCTION

It is General Secretary Xi Jinping who personally planned, deploy and promote the construction of GBA, which is also a national strategy. Outline Development Plan specifies the comprehensive plan for the strategic positioning, construction goals and development approach of GBA. Under this background, Guangdong, Hong Kong and Macao have moved forward toward a new stage with a new height. In this context, it is a must to follow the guidance of humanistic arts and aesthetic education if we are going to land the requirements of “constructing a HBA” and building a first-class bay area and world-class urban agglomeration with dynamics and international competitiveness. With the new mission of the times, the arts industry has ushered in a greater prospect and more historical opportunities.

As we all know, the three cities of GBA, which are geographically adjacent to each other, possess cultures of the same root, namely the inclusive Lingnan culture that integrates elements both from the East and the West. In addition, the three members have also maintained a close and interactive relationship in the course of modern art growth. Specifically, the artistic groups and artistic phenomena in GBA have reshaped the art landscape in

China, with an in-depth impact on the development of contemporary art and design in China. Under such a situation, art gallery as a vital carrier of modern sociocultural dissemination and display of aesthetics shoulders several duties, that is, collection, protection, research, dissemination and display of the material and intangible heritage of human beings. In particular, art gallery takes on a pivotal task, namely to guide, publicize, and exchange in terms of art development. In this way, it is able to effectively promote cultural integration and exchanges, enhance the cultural identity and sense of belonging of the public, and strengthen the cultural soft power in GBA [1].

Nowadays, the whole world has been permeated with concepts like instrumentation, interconnection, and intelligentization, in which case new technologies such as the Internet of Things, big data, and cloud computing have been applied to all walks of life. Globally speaking, be it the San Francisco Bay Area, New York Bay Area or Tokyo Bay Area, all of them focus on the research of AI technology without exception. Furthermore, they have all achieved results in realms including natural language processing, deep learning, machine learning, etc., which also brings new opportunities and challenges for art galleries. Currently, GBA is staying in the best position

regarding the advancement of AI. To put it in another way, art galleries in GBA live up to the mission and follow the pace of the times, so as to scale up from the original primary intelligentization to the future advanced AI. In this way is it possible to facilitate the work of inheriting and developing our excellent traditional Chinese culture, showing the unique humanistic spirit of Lingnan to the world, and assisting in the cultural construction in GBA.

2. THE CURRENT STATUS OF INTELLIGENTIZATION OF ART GALLERIES

Looking back, it has grown well regarding the intelligentization of art galleries, and it has even turned into the trend of the transformation of global art industry. In August 2009, IBM released the “Smarter Planet, Win in China” initiative, thus ushering in a new era of “Smarter Planet”. To put it in another way, all walks of life in China would implement the 3I revolution of “Internet of Things, Interconnection, and Intelligentization”, in which multiple international art galleries have taken a try in intelligentization. In April 2012, the Louvre Museum in Paris cooperated with IBM, which led to the first smart museum in Europe, setting off a wave of intelligentization of collections and exhibitions. Immediately, China has also joined the line, as seen by Guangdong Provincial Museum and Suzhou Museum identified as pilot units by the State Administration of Cultural Heritage. It is an effective attempt to intelligentize the museum and promote the upgrading and transformation from digitalization to intelligentization [2].

Currently, GBA is regarded as a key national area for high-tech development and a pilot area for cutting-edge technologies. In this context, art galleries in GBA are bound to deepen its efforts in intelligent service, protection and management, followed by the proceeding to the AI era

3. THE SUCCESSFUL PRACTICE OF INTELLIGENTIZATION OF ART GALLERIES IN THE THREE GLOBAL MAJOR BAY AREAS

Art galleries are endowed with functions of collecting, storing, exhibiting and studying works of art, and they tend to present visual art compared with traditional museums. Therefore, with the application of intelligent information technology, art galleries could integrate the advantages of smart museums, while constructing a relatively complete and mature art gallery intelligent ecosystem in different scopes such as art, time, and city. Therefore, intelligentization requires the successful cases of advanced civilizations around the world, which indicates that the experience of the other three major bay areas is conducive to the construction of intelligent art galleries in GBA with Chinese characteristics.

As early as 30 years ago, the New York GBA had introduced the prototype of intelligent art galleries. When it came to the early 1990s, Bill Gates established a digital image library through digital technology, dedicated to offering image services to global customers. He signed agreements with major art galleries and museums, aiming to collect works in the Corbis collection. Then in 1992, Apple also released CDs called “Virtual Art Gallery”, which were freely offered to 1,000 universities and museums around the world [3]. The audiences were allowed to review the detail information of each work through the virtual exhibition hall in the CD. Afterwards, in the context of popularized Internet and advanced technologies like AR and VR, the U.S. government published the *National Artificial Intelligence Research and Development Strategic Plan*, with attention to emerging information technologies such as AI. In terms of audience management, smart devices such as face recognition and smart tour guide are applied to collecting and analyzing the data of visitors intelligently; tools such as Dexibit is utilized to analyze and predict future audience visits by acquiring the focuses and preferences of audience, which also enhances the curation efficiency. Regarding the collection management, it tries machine learning and deep neural networks. For instance, the machine vision is used to identify and label images, as well as organize the collections. As for collection protection and restoration, robots allows for high-precision photos of cultural relics, which facilitates the work of staff. In the realm of collection authentication, Rutgers University developed a type of AI that helps identify the authenticity of paintings. All these successful practices herald a more intelligent and technological future for art galleries.

4. OPPORTUNITIES FOR INTELLIGENTIZATION OF ART GALLERIES IN GBA

4.1 The wave of the fourth industrial revolution

Cutting-edge technologies such as AI, robotics, and virtual reality have already served as the new engine of modern economic and cultural development, setting off a brand new technological reform. Under this background, AI as the core of the new round of industrial reform is going to further release the huge energy accumulated during previous relevant reforms, which helps reconstruct all links of economic activities such as production, distribution, exchange, consumption, etc. Thus, new demands for intelligentization would come into being in both the macro and micro aspects. In particular, the in-depth changes in creation, collection, exhibition and interaction of the field of culture and art would bring along significant new elements to the production, lifestyle and mindset of human beings, thus realizing the overall leap. Currently, China has risen to a new stage, during which it has been faced with the

arduous challenge of the supply-side structural reform. To this end, it is a must to accelerate the in-depth application of AI by expanding the relevant industry and injecting new momentum into our economic and cultural development.

4.2 National strategic guidance and resource support

In recent years, the rapid development of technologies such as big data, the Internet of Things, cloud computing, AI, and blockchain have deeply engraved concepts such as digital society, smart economy, and digital China in the mind of the public. As for the state side, China has given intense attention to “smart” and “intelligent” construction, as seen by the continuous introduction of national strategies, like innovation-driven development, that aims to enhance technological strength [4]. Driven by the government, high tech including AI has welcomed a period of rapid growth. In July 2017, the Ministry of Culture and Tourism of the People’s Republic of China issued a notice titled *Public Digital Culture Construction Plan during the “Thirteenth Five-Year Plan” Period*, proposing to encourage the construction of public digital culture under the guidance of the government and with the participation of the market and social forces. Besides, it suggests establishing a working mechanism with social forces engaging in public digital culture platform development, resource construction, service supply, and operation management. Moreover, China is committed to cultivating a pool of outstanding talents, based on whom it is going to develop high tech through various resources in GBA. At the current stage, art galleries should seize the opportunity of AI prosperity and the chances brought by national policies. Specifically, it is necessary to intensify theoretical research on the one hand, while actively apply AI to practice on the other hand, thus thriving to acquire greater progress under the policy advantage.

5. CHALLENGES OF INTELLIGENTIZATION OF ART GALLERIES IN GBA

In spite of the bright prospect, GBA art galleries have to face numerous obstacles on the road to intelligentization. For example, many problems still exist in AI and other high techs, which are highlighted by insufficient reserve of key hardware and open source software, as well as by further requirement of international cooperation. Actually, China plays a leading role in terms of data scale and type of the AI industry, and we have grown to maturity regarding the basic algorithms. As seen by key enterprises such as Huawei and Alibaba in GBA, who are setting out to build a basic-level ecosystem, lag far behind global first-class companies in software framework, especially open source framework, and chips, indicating an urgent demand for higher-level international cooperation.

Worse still, the hit of the COVID-19 has engendered an unprecedented financial crisis in art galleries. Under the pressure of reduced government funding, the suddenly dropped passenger flow due to quarantine policies, the declined revenue of stores, and the increased maintenance cost, art galleries have lost their viability and competitiveness step by step, presenting huge challenges to future improvement. Generally speaking, the massive reduction in funding will lead to the stagnation in the various links of construction, including AI high-tech construction that costs massively. Such a situation has greatly hindered the intelligentization of GBA art galleries, which is adverse to the future sustainable growth.

6. STRATEGIES FOR INTELLIGENTIZATION OF ART GALLERIES IN GBA

In recent years, GBA art galleries have also been searching for solutions, as seen by many positive tries in the innovation of intelligentization. It mainly falls into three aspects, namely business management, audience service and digital art, through which it intends to produce an art gallery integrating high tech, high intelligence, and large-scale service.

6.1 Improve audience service with intelligentization

In art galleries, intelligentized service management covers several sectors, that is, ticketing management, reservation management, parking management, navigation management, interaction management and consumption management. The intelligentized service for the audience allows for better visiting experience, which can be realized from three stages, namely pre-visiting, in-visiting, and post-visiting. Specifically, art galleries can introduce pre-visit reservation service, in-visit hall navigation and smart guide service, as well as post-visit survey for satisfaction and cultural and creative product promotions [5]. In summary, the intelligentized management of audience services symbolizes the level of informatization of art galleries. Therefore, art galleries should first resort to intelligentized means to optimize audience service management, thereby offering a better experience and improving the public cultural services conditions.

6.2 Connect the audience with the Internet

Nowadays, more audiences get access to and interact with art galleries through the Internet. In turn, the art galleries could get to know the audiences, like their demands, and provide them with more comprehensive and personalized information through the Internet. Additionally, the Internet allows art galleries to collect audience portrait information (including basic

information and face information), identify their own audience groups, and establish audience files. Based on the collected audience behavior information (including visiting behavior, interactive behavior, consumption behavior and hobbies, etc.) through an Internet platform, it is possible for art galleries to build a large-scale audience database for data research and analysis, thereby offering precise services to audiences. Another effective way comes to that art galleries could display the offline physical exhibition through online channels, like creating an online digital virtual exhibition hall. In this way, audiences could appreciate the exhibitions through the Internet without leaving home, thus ultimately connecting art galleries with audiences.

6.3 Display with digital technologies

In recently years, more young people have joined the line of visiting art galleries, but the traditional exhibition methods can no longer satisfy their demands, which can be solved through the Internet-based high-tech art. It covers video panorama, omnimax, naked eye 3D, VR device, somatosensory device, gesture recognition and various multi-sensing-centered virtual reality, augmented reality and mixed reality environment, which all hit the traditional exhibition methods of art galleries. For art galleries, digital technology can be applied to the design of exhibition layouts or exhibition elements, which surely will improve the visual enjoyability and artistry of exhibitions [6]. Besides, digital interaction can be integrated into public education activities, which will enrich the interaction between art galleries and audiences. On the one hand, it prompts the audiences to generate a deeper understanding of the exhibition; on the other hand, it injects new vitality into the traditional art galleries.

7. CONCLUSION

According to General Secretary Xi Jinping, “In an era with updating technology, we should assess the situation and formulate a specific plan. Through arrangements ahead of time and by taking the initiative, we could comprehend the current status and trend of AI, as well as its impact on socioeconomic growth in depth. Based on the existing achievements and problems of AI, we should promote the implementation of national strategy for AI.” The future of art galleries partially depends on high tech, including cloud computing, Internet of Things, big data, etc. Through high tech could it possibly create an intelligentized art gallery that meets the cutting-edge demands of the times, and realize intelligentization of gallery activities, including collection, protection, display, dissemination, research and management. In this way, we have confidence to bring high-quality public cultural services and exhibition experience to the audience.

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