ORIGINAL RESEARCH ARTICLE

Intelligent management system design for tourism, cultural and creative industrial park—Take the traditional district of Wudian City in Jinjiang as an example

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ABSTRACT

Taking Jinjiang Wudian City Tourism Cultural and Creative Industrial Park as the research object, we use the case study method to explore the intelligent management system design scheme of the tourism cultural and creative industrial park, and through field interviews, data collection, data coding and result analysis, we deeply analyze the tourism cultural and creative industrial park in Jinjiang Wudian City. Through the methods of field interviews, data collection, coding and result analysis, we analyze the management subjects and components of the management mode of Wudian City Tourism and Creative Industry Park in Jinjiang and identify its existing management mode. On this basis, it embeds technical elements of wisdom tourism, subdivides wisdom management composition modules of tourism cultural and creative industrial park, and finally forms a complete wisdom tourism management system of tourism cultural and creative industrial park.

Keywords: cultural and creative industrial park of tourism; smart tourism; management system; Wudian City

1. Introduction

China has successively issued a series of policies and measures to revitalize the cultural industry and vigorously develop the cultural industry to enhance the national cultural soft power. As a strategic emerging industry in China, cultural and creative industry has become an important force to promote the integrated development of cultural industry and creative industry. "Tourism + cultural creativity" industrial model is a new model for the development of tourism industry by integrating cultural creativity industry and tourism industry, giving full play to their advantages and integrating available resources. At present, driven by governments at all levels, cultural and creative industries have developed unprecedentedly in China, and tourism function has increasingly become one of the important functions of cultural and creative parks.

In the information age, the tourism cultural and creative industry park is no longer confined to the traditional management mode. The rapid development of modern science and technology provides more technical support for innovation and transformation for the management of tourism cultural and creative industry park. The tourism cultural and

CITATION
Sun J, Li Y. Intelligent management system design for tourism, cultural and creative industrial park—Take the traditional district of Wudian City in Jinjiang as an example. Smart Tourism 2022; 3(1): 9 pages.

Creative Industrial Park, which has both cultural inheritance function and tourism economic function, also has a new demand for information construction. Using new technologies such as cloud computing, internet of things and artificial intelligence to change the traditional management mode and build a smart tourism management mode of tourism cultural and creative industry park can promote the coordinated operation of resource management, tourists and enterprises at multiple levels and meet the needs of tourists.

2. Literature review

Cultural and creative industry is an industry cluster that takes cultural content and creative achievements as the core value, takes creation, creation and innovation as the means of realization, and takes the realization or consumption of intellectual property rights as the transaction characteristics to provide cultural experience for the public[1]. Under the general trend of industrial integration, the integrated development of cultural and creative industries and tourism industries has become a new development model. The agglomeration of tourism cultural and creative industries in a specific space constitutes a tourism cultural and creative industry park. The tourism cultural and creative industrial park is a functional gathering area that takes cultural creativity as the tourist attraction and meets the one-stop experience needs of tourists such as sightseeing, leisure and entertainment[2]. After reviewing the literature, this study defines the intelligent management mode of tourism cultural and Creative Industry Park as: using sensor network, internet of things and other technologies to realize the comprehensive, systematic and timely perception and fine management of the resource environment, infrastructure, settled merchants and disaster risk of tourism cultural and Creative Industry Park, so as to improve the intelligent degree of information collection, transmission, processing and analysis of tourism cultural and creative industry park, To create a comprehensive, real-time, interactive and sustainable information-based cultural and creative industry park management

goal[3].

Foreign countries carried out research on cultural and creative industries and tourism industries earlier, and the research content mainly focused on the role of industrial integration, tourists' tourism experience and influencing factors. In terms of industrial integration, Goede uses the case study method to analyze scharloo and pietermaai creative zones on curaçao Island, and points out that tourism is an important driving force for the development of creative economy and Creative Industrial Parks[4]. In terms of tourist experience and influencing factors, prentice divides tourist experience according to scale and discusses the influencing factors of tourist experience[5]; the on-site sampling method of Chena et al. determines the loyalty of tourists to the park[6]. Domestic researchers mainly study the connotation of cultural and creative tourism, the integrated development of tourism industry and cultural and creative industry, tourism cultural and creative products, etc. Jia et al. analyzed the key links of the integration of the two industries and the path to achieve industrial integration[7–8]. In terms of the development and design of tourism cultural and creative products, Zhao Hua and Yu Jing discussed the ways of the integrated development of rural tourism and cultural and creative industries on the basis of literature review[9]. At present, the research on tourism cultural and creative industry involves a wide range, but it is not deep enough. The research content is relatively single, and there is a lack of research on the internal management of tourism cultural and creative industry park.

The development of science and technology has triggered extensive discussion on smart tourism in academic circles. Many domestic scholars have studied the concept definition, core connotation, construction framework, value application, development trend of smart tourism and its relationship with tourism informatization. There is no consensus on the definition of smart tourism, but combing the previous views, it is found that smart tourism has two characteristics: on the one hand, the development of smart tourism needs strong technical elements; on

the other hand, the development of smart tourism is to better provide various tourism information and realize intelligent management. Huang Chao, Li and others believe that smart tourism is to use new technologies such as cloud computing and internet of things to actively perceive the information of tourism resources and tourism activities with the help of portable internet terminals, so as to timely release, understand, arrange and adjust the work plan, so as to realize the intelligent perception and utilization of all kinds of tourism information[10]; Liu and Fan proposed that smart tourism takes smart tourism system as an important technical support and online service as the basis to provide massive information storage and intelligent computing services to meet the needs of processing comprehensive tourism information[11]; on the basis of summarizing previous conceptual studies, Zhang et al. put forward the CAA framework system of smart tourism and expounded its four core technologies and value supply, including the discussion of smart tourism concept, the construction of user-oriented smart tourism experience platform and the construction of smart tourism technology framework[12]. After reviewing the literature, it is found that few scholars specifically discuss the smart tourism management of tourism cultural and creative industry parks. With the rapid development of tourism industry, the park management mode urgently needs innovation. The development of new technology can inject new vitality into the management of cultural and creative industry park.

To sum up, the current research on smart tourism mostly focuses on connotation discussion and system construction, and lacks in-depth research on practical application. Drawing on the concepts of smart city and smart scenic spot, this study aims to explore the management mode of tourism cultural and creative industry park under the background of smart tourism based on the traditional management mode. What technical elements need to be considered in the management link in order to form a complete smart management system. Through this research, it is expected to provide theoretical support for the smart tourism management of tourism cultural and creative industry park.

3. Case background and research methods

3.1. Case background

The case study object of this study is Jinjiang Wudian tourism cultural and creative industry park. In 2010, Jinjiang Municipal Party committee and Jinjiang Municipal government decided to take Wudian City as a folk culture reserve. In 2011, the folk culture reserve was officially named "traditional block of Jinjiang Wudian City". In 2015, Wudian City was rated as "national AAAA tourist attraction". Located in the core area of Qingyang in the old urban area of Jinjiang City, Jinjiang Wudian tourism, culture and creative industry park covers an area of 126 mu, including 132 buildings. It is the largest red brick ancient house complex in Southern Fujian Wudian tourism cultural and creative industry park is developed and constructed by Jinjiang Wudian development and Construction Co., Ltd. and Jinjiang Wudian development and Construction Co., Ltd., together with Fujian symbiotic cultural and Creative Industry Development Co., Ltd. and Septwolves Group Co., Ltd., jointly established and operated by Jinjiang Wudian traditional block operation Co., Ltd.

3.2. Research methods

This study uses the case study method to study the tourism cultural and creative industry park. The specific research process is as follows: In March 2017, the research team went to Wudian City in Jinjiang for two research interviews. Combined with data collection methods such as literature research, direct observation and in-depth interview, the research team obtained first-hand and second-hand materials that meet the research requirements (see **Table 1**). The research team conducted two field visits to the management of Wudian City in Jinjiang to identify, summarize and refine its operation management organization structure and constituent elements. The contents of the survey and interview mainly focus on two aspects: (1) The existing management subject, organizational structure and management mode of Wudian City in Jinjiang; (2) Embedded in

the existing smart tourism management elements of the park.

Table 1. Case study data

Data type	Acquisition method	Research interface	Research time
First-hand information	Field research	Construction orientation	March 23, 2017 to March 31, 2017
		Management subject	
		Composition module	
		Supporting elements	
Second hand information	Provided by Jinjiang Wudian Management and Operation Company		
	Internet information		

Research stage

(1) First inspection. Exchange topics related to the development and management of cultural and creative industrial parks with the main principals of Jinjiang Wudian traditional block operation Co., Ltd. This research is based on field interview, field observation and internal management and operation data provided by Jinjiang Wudian Operation Management Co., Ltd.

Before the investigation, the investigation team communicated with the person in charge of operation and management of Wudian City in Jinjiang in advance, made an appointment for the investigation and interview time, and explained the purpose and main contents of the interview. Before the interview, remind the interviewee that the interview is open to obtain true and comprehensive information. During the interview, one group member presided over the interview, four group members recorded it, and recorded the whole process with recording equipment. During the interview, the group members appropriately put forward some targeted questions to guide the interviewees to confirm and supplement some important contents. The interview time of the first inspection is about 90 minutes. After that, the members of the research team sorted out the interview notes and input all the interview notes and recording contents into the electronic document. Combined with the direct observation method, understand the

operation management, settled enterprises, implementation of management system, park design and other information of Jinjiang tourism culture and Creative Industry Park, and finally form pictures, audio recordings and written records.

(2) The second inspection. After combing and summarizing the data obtained in the early stage, conduct targeted field investigation on the cultural and creative industry owners and their cultural and creative industry enterprises in Wudian tourism cultural and Creative Industry Park in Jinjiang, understand the characteristics of enterprises settled in Wudian tourism cultural and Creative Industry Park, the management status of cultural and creative industry operators in the park, the existing business forms of the park, etc., and sort out these investigation results.

Coding stage

Data coding refers to the processing of research case data, which is to summarize, sort out and analyze seemingly messy and numerous data, then extract topics from a large number of qualitative and quantitative data, analyze and summarize relevant concepts and data relations[13,14].

Among the large amount of relevant data and information obtained by the researchers, there are unprocessed information, such as the document records of interviews, as well as the information after sorting and analysis, such as the internal data provided by the operation organization of Wudian City. Among them, the applicable data ensure that they are related to the research content. These data are distributed in the collected data and appear in the form of words and numbers expressing certain meanings[15].

According to the standard case study coding procedure, sort, summarize and classify all the original case materials, read the preliminarily processed case materials in detail, and analyze them step by step, so as to sort the original messy recording and text materials into clear information. Then, review and verify the coding content to ensure the accuracy and strictness of data coding in the case study. The

data coding process of this study mainly follows the following principles: first, the selected items must be related to the theme of the research stage, that is, eliminate the data that is not related to the research content; second, when counting the number of items, it is necessary to consolidate and summarize the items from different data sources (documents, interview records, etc.); third, in the process of data coding, if there are new ideas or deficiencies in the early coding work, they should be put forward and discussed with the members of the project team.

4. Case analysis

4.1. Management subject and its evolution

The management mode of tourism cultural and creative park refers to a complex system composed of relevant factors inside and outside the park[16], it is necessary to integrate supporting elements, improve the internal and external environment and management and operation mode of the cultural and creative park, and build a park management platform to maximize its comprehensive benefits.

Combined with the field investigation and interview data, it is found that the ownership and management right of Wudian City are separated. In this study, the main body of Wudian City park is divided into three parts: development main body, internal operation main body and external support main body. Among them, the main developer is Jinjiang Wudian development and Construction Co., Ltd., which is responsible for the early investment, development and construction of Wudian tourism, culture and Creative Industry Park, and evolved into the later operation and management of the park; The internal operation subject is mainly Jinjiang Wudian traditional block operation Co., Ltd., which is funded by various organizations. The company is mainly responsible for investment promotion and operation, implements market-oriented operation under the effective supervision of the government, and explores the management mode of "culture and commerce", "protection and utilization", "transformation and revitalization" of Jinjiang Wudian tourism cultural and creative industry park; The main external driving force is Jinjiang Municipal People's government, which takes the lead in organizing development and construction and providing policy support to promote the macro development of Wudian cultural and Creative Industrial Park (see **Figure 1**).
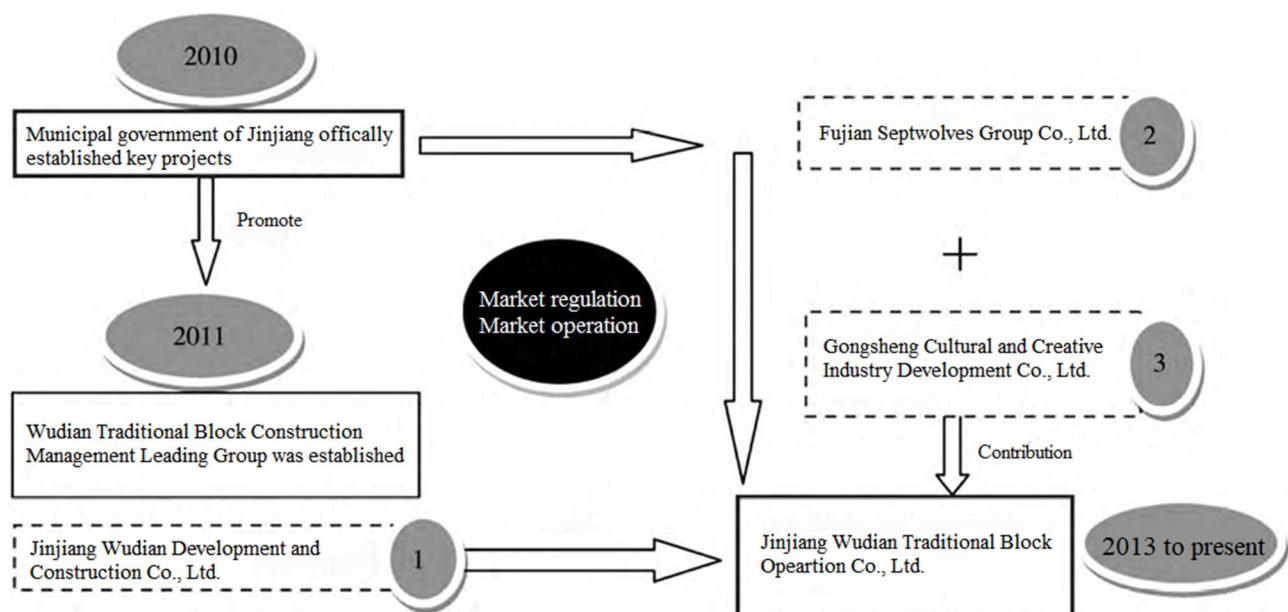

Figure 1. Evolution process of management subject in Wudian City.

4.2. Management pattern recognition

Wudian Tourism Cultural and Creative Industry Park is a planned park led by Jinjiang Municipal

People's government and Jinjiang Tourism Bureau. A special operation and management company is responsible for the market-oriented operation and management and the overall development design of the park.

According to the data, Wudian currently focuses on the fine management of traditional cultural blocks, focusing on the modules of cultural management, resource management, system management and information management in the park. The management environment includes policy support, social environment and cultural environment (see Figure 2). The management mode is mainly market-oriented and tourist centered, but it lacks perfect integrated design. According to the field investigation and interview, the current intelligent management level of Wudian City is low. The only intelligent tourism management elements are the installed pedestrian flow detection system and the intelligent navigation system being made, and there is a lack of systematic intelligent tourism park management design.
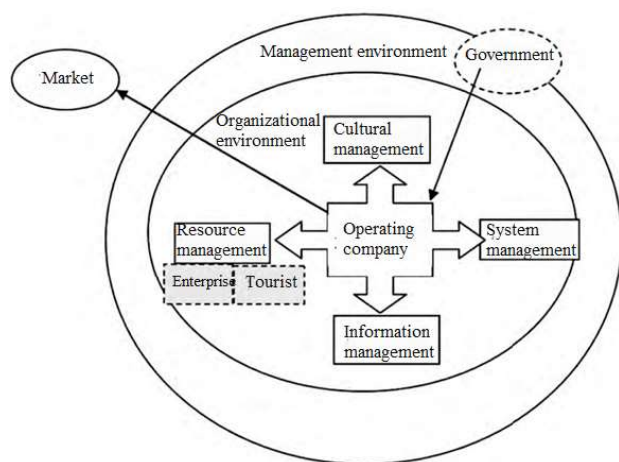

Figure 2. Overall management mode of Wudian City.

5. Construction of Wudian smart tourism management system

5.1. Construction orientation

According to the strategic positioning, Wudian City in Jinjiang tries to integrate traditional culture with tourism, focusing on the brand of traditional

culture in Southern Fujian On the basis of the original visual appreciation and taste experience of the tourism cultural and Creative Industry Park, strive to improve from the three aspects of hearing, touch and feelings, create a tourism industry with traditional culture as the main characteristics, further expand the publicity and promotion of the tourism cultural and Creative Industry Park, actively improve the tourism product structure, enrich the tourism product system of the block, and create a new cultural tourism landmark focusing on traditional culture display and folk custom experience, making it the preferred tourist destination for tourists. The park management will be market-oriented, driven by the needs of tourists and settled enterprises, and provide perfect services. The construction orientation of smart tourism management mode in the park is consistent with its strategic positioning, trying to meet its management needs.

5.2. Object oriented

The smart tourism management mode of Wudian tourism cultural and creative industry park mainly serves park managers, settled enterprises and tourism enterprises. The management of tourism cultural and Creative Industry Park involves many elements and aspects. The purpose of this study is to point out the direction for the managers of the tourism cultural and creative industry park to build the smart tourism management mode of the park. That is, the park managers embed technical elements on the basis of the original management mode to realize the real-time intelligent management, detection and early warning of the park, so as to improve the intelligent management level of the whole park.

5.3. Composition module

Based on the functional requirements of the management information system of Wudian traditional block operation management company, the constituent modules of its intelligent management mode are divided into command and dispatching

module, business management module, electronic monitoring module, safety assurance module, traffic management module, resource management module, tourist service module and marketing promotion module.

(1) Command and dispatching module. Through the internet of things, internet, cloud computing technology and relevant software systems, the tourism attraction, internal and external environment, passenger flow, transportation, safety and other elements of Wudian tourism cultural and creative industry park are managed in an overall manner to realize the overall orderly and healthy operation.

(2) Business management module. Systematically manage the tourism enterprises that provide services to tourists in the park (tourism enterprises mainly include cultural and creative enterprises and tourism enterprises), as well as the tourism attractions that can be visited and experienced, establish relatively complete data files, conduct real-time dynamic monitoring of the tourism enterprises in the tourism cultural and Creative Industry Park, and adjust the layout of the park in time.

(3) Electronic monitoring module. The important function of the tourism cultural and creative industry park is to promote the development of tourism. Intelligent monitoring is to refine the distribution of main scenic spots, crowded areas and traditional characteristic buildings in Southern Fujian, implement intelligent video coverage, and effectively store and analyze the monitoring video information.

(4) Security module. There are many potential safety hazards in the multi-element complex system. This module builds a real-time monitoring and prediction platform for pedestrian congestion and a management platform for public security firefighting facilities and equipment. With the help of the public security system and the intelligent monitoring records in the park, a special automatic fire alarm system is established to ensure the all-round detection and scientific management of security and fire-fighting in the whole park, so as to achieve real-

time monitoring, rapid processing and scientific prediction.

(5) Traffic management module. At present, the design of tourist access routes in Wudian tourism cultural and creative industry park is not reasonable. Different from the traditional traffic management mode, the traffic management module can save human resources, implement centralized dispatching and unified management of tour buses in the park with the help of GPS positioning and other technologies, optimize the parking management of private cars and tour buses in the tourist center, implement the intelligent management of all-in-one card, and solve the problem of "difficult parking".

(6) Resource management module. Classify and sort out the resources in the tourism cultural and creative industry park to form a complete resource management directory, implement cloud data management and establish a standardized management system, establish electronic archives of buildings, cultural relics and historic sites, material and intangible cultural heritage in Wudian cultural and Creative Industry Park, and update resource information in real time.

(7) Tourist service module. It is mainly composed of Wudian City electronic ticket, tourist service center, electronic guide system, tourist complaint interactive platform, self-service shopping guide, 360° virtual tourism system, etc., so that the park can realize integrated management and provide more convenient and all-round services for tourists.

(8) Marketing promotion module. Determine multi-channel and multi-mode promotion schemes, form an integrated marketing and promotion platform with the help of internet of things and internet technology, including e-commerce platform of the park, official publicity website of the park, tourist data center, online marketing and promotion and other systems, and optimize the image of Wudian cultural and creative industry park.

5.4. Supporting elements

(1) Infrastructure support. The information infrastructure of smart scenic spot covers three aspects: information network infrastructure, spatial data infrastructure and information sharing service platform. During the 12th Five Year Plan period, the focus of smart scenic spot construction is the improvement of information infrastructure[17]. To realize smart tourism management, infrastructure construction is indispensable On the one hand, to build a smart tourism management platform embedded in information technology, we need to use advanced internet of things, cloud computing and other information technologies to comprehensively perceive, collect and integrate the resource information of tourism cultural and Creative Industry Park, analyze, calculate and process the data, and transmit it through internet, satellite communication and other network equipment, so as to realize the intelligence of the whole management process; On the other hand, infrastructure

construction to meet the needs of tourists in the park is essential. For example, the construction of fully covered WiFi wireless local area network can provide high-speed and convenient internet access, which can match the needs of intelligent interpretation and virtual tour in the scenic spot.

(2) Data support. At present, there are few embedded elements of smart tourism in the park, lacking complete supporting data and relevant management guidance. Dang et al. routinely classified the big data of scenic spots, pointing out that the conventional big data classification of smart scenic spots includes spatial data and attribute data, and the new classification standard is divided into static data and dynamic data[17]. Smart tourism management needs the data support of tourism cultural and creative industry park to realize accurate and scientific intelligent management.
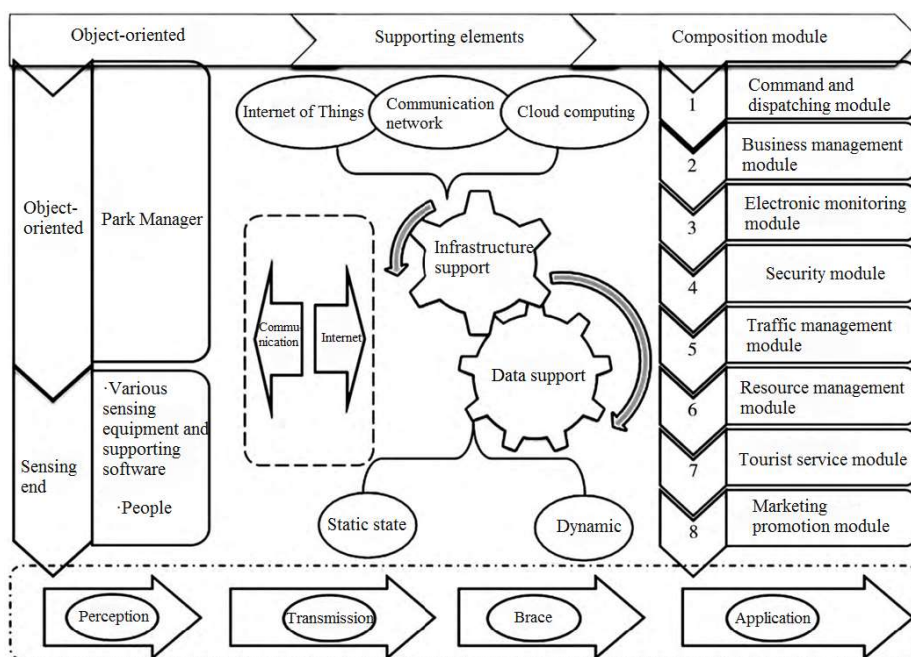
Figure 3. Intelligent management mode of the Tourism Cultural and Creative Industry Park.

6. Conclusions

Cultural and creative parks are an important carrier for the development of cultural and creative industries, and tourism cultural and creative parks are an important platform for realizing the integrated development of cultural industries and tourism

industries and promoting the transformation and upgrading of tourism industries. In the information age, the rapid development of science and technology provides new opportunities for the innovation of management mode of tourism cultural and creative industry park. Based on the on-the-spot investigation and in-depth interview of the cultural and Creative

Industry Park in Wudian City, Jinjiang, this study refines the important management elements and studies the intelligent management mode of the cultural and creative industry park. The research holds that: (1)the perfect infrastructure construction and intellectual support of the park is an important premise for the construction of the intelligent management mode of the tourism cultural and creative industry park; (2)In the future, the development of intelligent management in the park will be more refined and dynamic; (3)The intelligent management system of tourism cultural and creative industry park is a complex system in which multiple elements work together.

Conflict of interest

The authors declare no conflict of interest.

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