Journal of Coastal Research	SI	106	93–96	Coconut Creek, Florida	2020

Development of Hainan Marine Travel Tourism Sphere Model: A Global Perspective

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ABSTRACT

Qin, H., 2020. Development of Hainan marine travel tourism sphere model: A global perspective. *In:* Gong, D.; Zhang, M., and Liu, R. (eds.), *Advances in Coastal Research: Engineering, Industry, Economy, and Sustainable Development*. *Journal of Coastal Research*, Special Issue No. 106, pp. 93–96. Coconut Creek (Florida), ISSN 0749-0208.

In order to analyze the role of global tourism in promoting the development of marine travel tourism in Hainan, this paper puts forward a strategy for the construction and development of a Hainan marine travel tourism sphere model from the perspective of global tourism. By promoting the development of the Hainan marine travel tourism sphere from the perspective of global tourism, and allocating the limited resources to the production of products and services from the perspective of global tourism, the best economic benefits can be achieved to meet the needs of different social groups for marine travel tourism. Finally, the feasibility and validity of the proposed global tourism horizon to promote the Hainan marine travel tourism sphere are verified by experiments.

ADDITIONAL INDEX WORDS: *Hainan marine travel tourism sphere, global tourism perspective, model construction.*

INTRODUCTION

With the formation and continuous development of China's global tourism horizon, market mechanisms have gradually played a fundamental role in the allocation of marine tourism in Hainan, and the process of global tourism has been accelerating (Burgin and Hardiman, 2015). The parameters in the Hainan marine travel tourism sphere model are constantly changing in the process of construction, so it is necessary to use an algorithm to adjust the parameters. With its uniqueness and self-changing nature, global tourism can be adjusted independently and applied to the construction and development strategy of the Hainan marine travel tourism sphere, thus ensuring the stable operation of the Hainan marine travel tourism and realizing the allocation of limited resources to the production of products and services in the global tourism horizon in order to meet the disparate needs of different people (Cirer-Costa, 2015). The role of a global tourism perspective in the construction of a Hainan marine tourism sphere model is very important (Jang *et al*., 2014).

The 21st century is an era of experience and leisure economy, an era of oceans, and an era of tourism development in China. As one of the important parts of marine tourism, marine travel tourism not only has the characteristics of experience, but it also can satisfy people's need for exploration. With its inherent advantages of experience, entertainment, and challenge, it will become a new consumption hotspot, a new way of life, and an important part of people's lives in the tourism industry. Its influence should not be underestimated. At the same time, since 2010, Hainan has started to build an international tourism island. Tourism has developed rapidly and occupied a growing share in Hainan's economy and society, showing tremendous influence and development potential. In February 2016, Hainan Province was the first pilot province of global tourism in China, bringing new opportunities to the development of marine travel tourism in Hainan. It not only accelerated the construction of the marine travel tourism sphere in Hainan, but it also had a very important impact on promoting the improvement of the international travel tourism island (Lopes *et al*., 2017).

Global tourism is a new concept and mode in tourism, that is, regional tourism as a whole tourism area to plan and build. At present, the concept of global tourism is still a brand-new one. There are few studies on it, and most scholars study only a part of it. From the overall point of view, that is to say, in a certain regional scope, the tourism industry should be developed from the overall and global perspective, so that the tourism resources and social factors can be allocated and utilized in the most reasonable way, and ultimately the regional tourism can be globalized.

The Hainan marine travel tourism sphere refers to the sum of various conditions and elements that a society needs to provide products and services for marine travel tourism from a global tourism perspective. It generally includes tangible resources such as human, material, and financial resources. In this paper, starting from promoting the construction a marine travel tourism sphere from the perspective of global tourism, we propose the Hainan marine travel tourism sphere (HMTTS), which integrates the perspective of global tourism. This paper introduces the global tourism horizon model into the construction of the Hainan marine travel tourism sphere model and promotes the analysis of Hainan marine travel tourism sphere by satisfying the specific nonfunctional needs of Hainan marine travel tourism.

DOI: 10.2112/SI106-024.1 received 30 November 2019; accepted in revision 5 January 2020.
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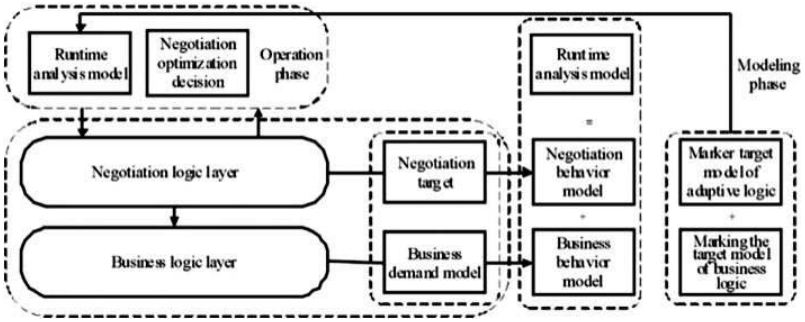

Figure 1. HMTTS framework.

CONSTRUCTION AND DEVELOPMENT OF THE HAINAN MARINE TRAVEL TOURISM SPHERE

Model of the Hainan Marine Travel Tourism Sphere

By analyzing the intrinsic demand and social demand for the Hainan marine travel tourism sphere, HMTTS perfectly combines the global tourism horizon with dynamic model construction. The construction of the HMTTS model in this paper is divided into a design stage and an operation stage, as shown in Figure 1.

In the design stage, the construction and development of the Hainan marine travel tourism sphere is divided into two parts: the demand analysis and the model construction. Among them, the demand analysis incorporates the global tourism horizon to complete the analysis task of promoting Hainan marine movements tourism circle from the global tourism horizon perspective. The negotiation module seeks to meet the optimal allocation for resources in the Hainan marine travel tourism sphere, and the execution module applies the optimal allocation obtained through the model construction to the model in order to achieve effective control of the model.

Establishment of the Hainan Marine Travel Tourism Sphere

The negotiation module evaluation of the Hainan marine travel tourism sphere consists of x_i and x_j in the recent h direct interactions satisfying $E_{ij} = \left\{e_{ij}^{(1)}, e_{ij}^{(2)}, \cdots, e_{ij}^{(h)}\right\}$, in which $0 \le e_{ij}^{(k)} \le 1$, $k \in [1,h]$, and $h < H$, where, H stands for the highest valid historical value in the record. The elements in E_{ij} are generally sorted with reference to the order of the interaction time, where, $e_{ij}^{(1)}$ stands for an interactive operation that has the longest interval from the current time, and $e_{ij}^{(h)}$ stands for an interactive operation that has the shortest interval from the current time. Hence, the process of evaluation of the negotiation satisfaction can be expressed as the following:

$$Y_1(x_i,x_j) = \begin{cases} \sum_{k=1}^{h} e_{ij}^{(k)} \gamma(k)/h, & h \neq 0 \\ 0 & h = 0 \end{cases} \quad (1)$$

In the equation, $\gamma(k) \in [0,1]$ stands for the attenuation function, which is mainly used to carry out effective weighted computation on the negotiation information that occurs in different time periods. In accordance with the general thinking habits of people, more weighted computation should be carried out on the interactive actions that occurred most recently, and the attenuation function can be expressed as the following:

$$\gamma(k) = \begin{cases} 1, & k = h \\ \gamma(k-1) = \gamma(k) - 1/h, & 1 \le k \le h \end{cases} \quad (2)$$

At present, the main disadvantage of the general model of promoting Hainan marine travel tourism from the perspective of global tourism is that safety factors are not fully taken into account. In the construction of the Hainan marine travel tourism sphere model, the key point is how to forecast and manage potentially destructive behavior. According to the basic principle of safety early warning in economics, this paper defines the safety of Hainan marine travel tourism from the perspective of promoting global tourism. The following expressions were used to define safety factors in the context of the Hainan marine travel tourism sphere:

$$\begin{aligned} R(x_i,x_j) &= S_j(1 - \Gamma(x_i,x_j,s,t-1)) \\ &= \Psi(\Gamma(x_i,x_j,s,t-1))[1 - \Gamma(x_i,x_j,s,t-1)] \end{aligned} \quad (3)$$

In the equation, S_j stands for the service content that is required by x_j. If the value of S_j increases, the existing safety will also become larger, that is to say, the relationship between safety and S_j is proportional. Here, $\Gamma(x_i,x_j,s,t-1)$ stands for the allocation of the Hainan marine travel tourism sphere by x_i to x_j on the nearest time stamp. If the negotiation value is higher, then the safety will be smaller; that is, the relationship between the safety and $1 - \Gamma(x_i,x_j,s,t-1)$ is proportional. The negotiation safety function refers to the uncertainty of the travel industry suppliers on the demand of requesters and the understanding of the travel industry service behavior that this paper can provide. It has the relationship with Equation (3) as follows:

$$Y_2(x_i,x_j) = 1 - R(x_i,x_j) \quad (4)$$

According to Equation (3) and Equation (4), it can be concluded that there are two dimensions in $Y_2(x_i,x_j)$: (1) Intentional attacks on the Hainan marine travel tourism sphere among people who request supplies. If the level of public travel resource model construction is higher, the global tourism perspective for this kind of malicious behavior will be lower; otherwise, it will be higher. (2) It is closely related to the quality

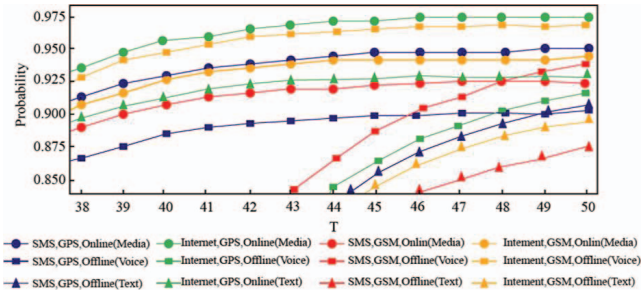

Figure 2. Public movements resource model of REL1 under different structural designs.

of services provided by public travel construction. If the quality of the services provided is higher, the existing safety will be lower. According to Equation (4), the relationship between $Y_2(x_i, x_j)$ and $R(x_i, x_j)$ is inversely proportional, which is mainly determined by the construction of the overall resource model according to Equation (1). Also, the negotiation safety function is denoted by DF, which is inversely proportional to $R(x_i, x_j)$.

The active degree of the public travel resource allocation shows the active degree of resource allocation from the side. If the information feedback is larger, this indicates that the number of successful interactions with the public travel resource model construction is larger. If the public travel resource allocation active degree is higher, it also suggests that the global tourism perspective has a very high degree of credibility.

$$Y_5(x_i, x_j) = \frac{1}{2}[\Phi(L) + \Phi(n_{total})] \tag{5}$$

In the equation, $\Phi(x) = 1 - (1/x + \delta)$, L stands for the number of the providers of the feedback, n_{total} stands for the total number of resources in the Hainan marine travel tourism sphere that have interactive relationship with j, and the constant of adjustment δ of $\Phi(x)$ is a constant that is not less than zero. It mainly aims to ensure the speed that $\Phi(x)$ is approaching 1. If the value of δ becomes larger, the speed that $Y(x)$ is approaching 1 will also become faster. According to Figure 1, the following can be concluded: The active degree $Y_5(x_i, x_j)$ of allocation of the Hainan marine travel tourism sphere is mainly determined by two variables, that is, L and n_{total}. The quantity of other resources allocated to the Hainan marine travel tourism sphere will also increase, and the value of $Y_5(x_i, x_j)$ will increase accordingly. At the same time, the number of providers of feedback increases, and the value of $Y_5(x_i, x_j)$ will also increase. However, the number of variables L and n_{total} has truthfully reflected the active level of Hainan marine travel tourism in the model construction. For example, if $n_{total} = 15$, $n_{total} = 15$, δ=0.2, then $Y_5(x_i, x_j)$=0.87.

EXPERIMENT AND RESULT ANALYSIS

HMTTS mainly uses PRISM to test the stability of the construction and development strategy of Hainan marine travel tourism sphere. The process of building the Hainan marine travel tourism model can be considered as the process of resource demand allocation in different structure and parameter models. This paper focuses on how to build the model of Hainan marine travel tourism according to social needs and optimize the optimal parameters of MobIS. In order to solve this problem more quickly, PRISM, a random testing tool, is used to verify the reliability requirement of the model. The expression of the reliability requirement to be verified has been given. The parameters of the Hainan marine travel tourism model are as follows: parameter T0 takes 5 as step size, value range is [5, 25], unit is min; parameter B takes 50 as step size, value range is [50, 250]. For each type of network, MobIS has 208 candidate configurations ($= 2 \times 2 \times [2 \times 5 \times 5 + 2]$). The setting of parameters optimization will be divided into two steps: one is the frame design of Hainan × model, and the other is the parameter optimization based on the frame already designed.

Optimal Structural Design

Figures 2 and 3 show the test results of REL1 and REL2 when the value (15, 150) is taken for the parameter (T0, B), respectively, under the condition of different structural frameworks. It is necessary to continuously optimize the structural framework in the model with reference to these experimental results. Since the value set for the threshold of REL1 is 0.90, all 13 settings in which the probability values

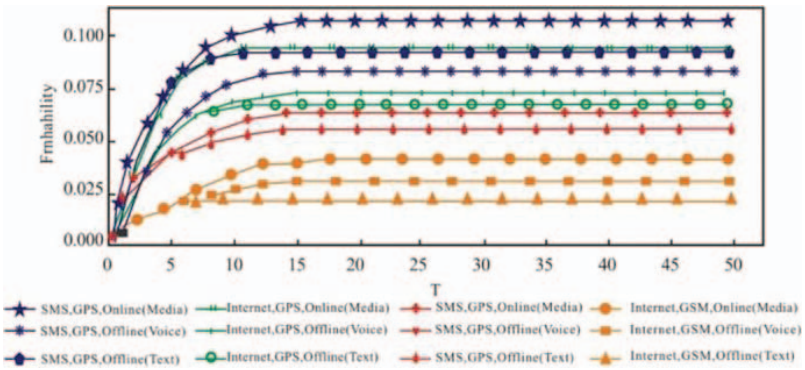

Figure 3. Public movements resource model of REL2 under different structural designs.

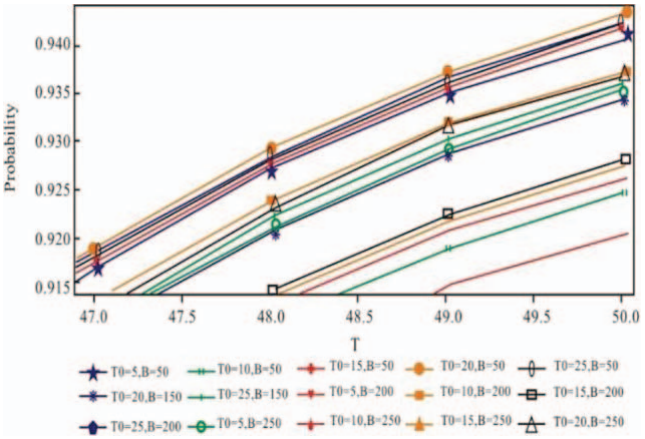

Figure 4. Probability of REL1 under different parameter configurations.

remain above 0.900 in Figure 2 can be selected as the candidate settings. However, the value set for the threshold of REL2 is 0.05. Therefore, all five settings with the probability value below 0.050 in Figure 3 can be selected as the candidate settings. The intersection of these two sets of candidate settings is {SMS,GSM,Offline(Text)},{Internet,GSM,Online(Media)}, {Internet,GSM,Online(Text)},{Internet,GSM,Offline(Voice)} and {Internet, GSM, Offline (Text)}. In reference to people's preference for P1, in order to ensure that people can obtain the real-time information after the update, it is necessary to select the Online mode in the model to obtain the information. In reference to people's preference for P2, in order to ensure that people's interactive experience is more realistic, it is necessary to acquire the media information in the model in real time.

Optimal Parameter Configuration

Figures 4 and 5 show the probability distribution of the model under REL1 and REL2, respectively, under different parameter settings in the structure {Internet, GSM, Online (Media)}. It can be seen from Figure 4 that all 15 parameter settings are in compliance with REL1. If the parameter T0 is the same, the value of the parameter B will be greater, which in turn will increase the value of the probability.

CONCLUSIONS

The main objective of the HMTTS method is to achieve efficient consultation on the allocation of Hainan marine travel tourism resources from the perspective of global tourism, so as to ensure that the allocation of resources can meet the needs of customers. The process of building the Hainan marine travel tourism model mainly involved construction of a Hainan marine travel tourism model for specific needs after the model analysis algorithm was processed. The construction of the Hainan marine travel tourism model provides a new way of thinking, which is different from other existing models based on Hainan marine travel tourism sphere. It describes the accuracy of the Hainan marine travel tourism model with simple elements and semantic display.

ACKNOWLEDGMENTS

Funding was provided by the Research on Rural Sports Development Strategy under the Background of "Beautiful Countryside" Construction in Shaanxi Province 2019010.

LITERATURE CITED

Burgin, S. and Hardiman, N., 2015. Effects of non-consumptive wildlife-oriented tourism on marine species and prospects for their sustainable management. *Journal of Environmental Management*, 151, 210–220.

Cirer-Costa, J.C., 2015. Tourism and its hypersensitivity to oil spills. *Marine Pollution Bulletin*, 91(1), 65–72.

Jang, Y.C.; Hong, S.; Lee, J.; Lee, M.J., and Shim, W.J., 2014. Estimation of lost tourism revenue in Geoje Island from the 2011 marine debris pollution event in South Korea. *Marine Pollution Bulletin*, 81(1), 49–54.

Lopes, P.F.M.; Mendes, L.; Fonseca, V., and Villasante, S., 2017. Tourism as a driver of conflicts and changes in fisheries value chains in marine protected areas. *Journal of Environmental Management*, 200, 123–134.

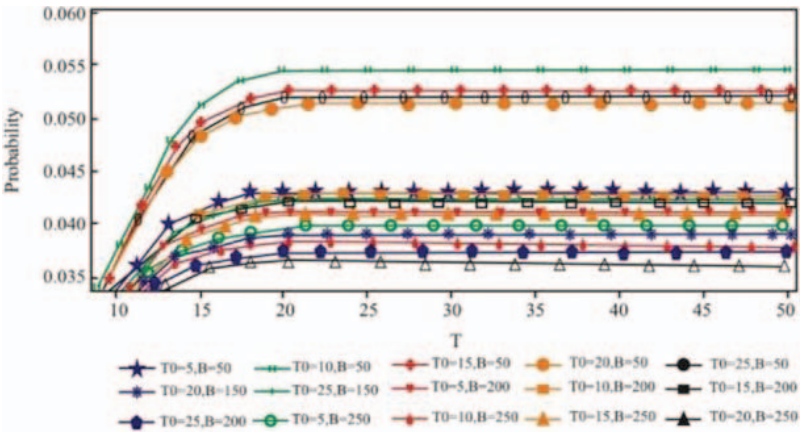

Figure 5. Probability of REL2 under different parameter configurations.