

Digital Innovation Strategy for Travel Agents to Combat Climate Warming

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Abstract: Climate warming leads to great opportunities and difficulties for travel agencies. In order to promote the development of travel agencies in the new situation, this paper studies the digital innovation strategy of travel agencies to deal with climate warming. Through in-depth interviews with 13 travel agencies, the impact of climate warming on travel agencies was discussed from multiple perspectives. Investigate the digital innovation response strategies of this group under the influence of climate warming on tourism, analyze and try to give travel agencies' digital innovation strategies to respond to climate warming. In order to provide some help for the sustainable development of travel agencies.

Key words: Climate warming; Travel agency; Digital innovation; Tourism resources

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1 Introduction

With the global warming, travel agencies have been greatly affected and challenged. How to find their own way to win and innovate in the climate warming environment has become a top priority for travel agencies, especially travel agencies. As an industry deeply affected by natural resources, the change of natural resources conditions brought by climate warming has seriously affected the popularity of tourist destinations. If some travel agencies carry out more tourism projects in destinations that are no longer popular due to the change of tourism resources, it will be difficult to attract more tourists to a large extent, or some travel agencies will provide more tourists to

reduce the tourism consumption of the destination, and even lead to the loss of original tourists. Therefore, many scholars have carried out relevant research on how travel agencies deal with climate change. For example, Wang Lingen et al^[1] analyzed the decision-making and experience of tourists in the Qinghai Tibet Plateau under the background of climate change, and proved that the warming and wetting trend of the Qinghai Tibet Plateau climate has a positive effect on improving the tourist experience in the region; Zeng Yuxi et al^[2] in order to strengthen the quantitative research on the impact of climate change on travel agencies and help them realize their sustainable development in the context of climate change, they carried out research on this issue; Liu Jia et al^[3] analyzed domestic research hotspots and prospects on climate change and tourism based on bibliometrics and social network analysis. The above scholars have analyzed the impact of climate change on travel agencies, but at present, they have analyzed the innovative measures of travel agencies in the face of climate change. Therefore, based on the digital platform, this paper analyzes the digital innovation ways of travel agencies to deal with climate warming.

2 Literature review

Digital innovation refers to the digital products of new business, which usually exists in the form of app, and explores the commercial application of the Internet of things, blockchain, quantum computing and other cutting-edge technologies. Digital platform refers to a public service platform integrating automation, informatization, high efficiency and low cost. At present, it has been used in many fields to realize the sharing of information resources, and can be fully applied, which provides the role that other ways are hard to achieve for the development of those fields. Global warming

directly affects the development of travel agencies, and climate warming and extreme weather events will directly affect the development of travel agencies in tourist destinations and the travel needs of tourists. This is closely related to the nature of travel agencies' dependence on the natural environment^[4]. Although climate change has brought undeniable impacts and challenges to travel agencies, in the new Internet environment, the rapid development of digital platforms has brought travel agencies new ways to deal with climate warming. The construction of digital platform can provide necessary analysis for travel agencies to cope with climate warming. Therefore, this paper will provide digital innovation strategies for travel agencies based on the construction of digital platform.

3 Methodology

If you want to provide travel agencies with digital innovation, you must first analyze the impact of climate warming on travel agencies. To make travel agencies and the travel industry better survive in today's environment, we must carefully analyze the various effects of global warming on the travel industry[5-7]. Therefore, based on the method of feature analysis of news interview, this paper interviewed 13 travel agencies in China. The content of the interview included the aspects that many enterprises think climate warming affects the development of travel agencies and how travel agencies can deal with the problem. Try to analyze the impact of climate warming on travel agencies as a whole, and try to give travel agencies a digital and innovative strategy for coping with climate warming, in order to provide certain help for the sustainable development of travel agencies. The basic information of the 13 travel agencies is as Table 1.

Table 1. Basic information of 13 travel agencies

Number	Enterprise operation time/year	Is there a branch	Can you travel abroad	Is it possible to book online
H1	5	Yes	Yes	Yes
H2	13	Yes	Yes	Yes
H3	10	Yes	Yes	Yes
H4	9	Yes	No	Yes
H5	5	Yes	Yes	Yes
H6	8	Yes	Yes	Yes
H7	5	Yes	Yes	Yes
H8	2	No	No	No
H9	11	No	No	Yes
H10	8	No	No	Yes
H11	9	Yes	Yes	Yes
H12	4	Yes	Yes	Yes
H13	9	Yes	Yes	Yes

3.1 The influence of climate warming on tourist flow

The impact of climate warming on travel agencies can be analyzed from the perspective of transmission path of the impact of climate warming on tourism passenger flow[8-9]. Tourism demand is a necessary condition for tourists to choose a certain tourist destination, which will have a great impact on tourist flow. Climate warming and extreme climate events will directly affect the development of travel agencies in tourist destinations. This impact is mainly produced by changing the impression of tourist destinations in the minds of tourists and changing the psychological expectations and behavior patterns of tourists. The transmission path is as Figure 1.

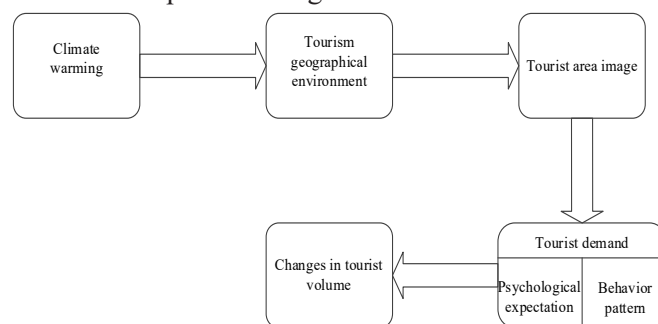


Figure 1. Analysis of the impact path of climate warming on tourist flow

Climate warming also has an extremely important impact on tourist flow. First of all, due to global warming, the environment of the former tourist comfort zone may become worse, which will reduce the quality of tourist experience and the number of tourists, which will affect the development of travel agencies in this region in the long run. H9 enterprise mentioned that a tour group of a northern unit went to Sanya in July. However, it could not adapt to the climate of Sanya, which reduced the sense of experience. The tour group originally planned to play for 7 days, but it only took 3 days to return. As a result, the tourists who participate in the tour are less likely to choose Sanya City in the following summer, and their experience will also affect the choice of the people they contact. Secondly, global warming will cause the peak tourist season of some tourist destinations to change, and to extend or shorten. As the temperature rises, the peak season suitable for traveling in some tourist destinations may be delayed or moved forward. Finally, it will increase or ease the pressure on the capacity of the tourism environment of different tourist destinations. H1 and the interviewees said that in the past, compared with

other famous scenic spots, the number of tourists in Mohe River North Pole Village was small, but in recent years, the number of tourists in summer has increased significantly, and the number of visitors to the park must be controlled almost every day. H10 also said that Chengde summer resort has seen a sharp increase in tourists, which is enough to prove that climate warming has a greater impact on some tourist destinations that originally received less tourists but due to the suitable climate. For those areas where the number of tourists has decreased due to climate warming, the pressure on the capacity of the tourism environment is released, allowing the locals to re-formulate their development plans, thereby seeking new development opportunities and realizing their own tourism industry transformation. However, for those areas that have become tourist comfort zones due to climate warming, it may lead to a sudden increase in the capacity of their tourism environment, and may even cause the destruction of the local ecological environment due to the increase in tourists. As mentioned in H2 and H3, the more popular “scenic tour” and the climax of polar tourism in recent years have greatly damaged and disappeared the fragile vegetation in Svalbard archipelago of Norway, which is located in the Arctic region. Even the local wildlife is facing more and more severe challenges.

3.2 Impact of climate warming on tourist demand

Climate change can have a non-negligible impact on travel agencies, mainly in the formation of tourist demand. This is because climate change will cause some tourists to feel less favorable towards the area, which may cause them to seek new tourist destinations and cause their travel agencies to be affected. Therefore, it is necessary to analyze the impact of climate warming on the tourism demand of specific tourist destinations.

First of all, climate warming has caused varying degrees of temperature rise in tourist destinations with lower latitudes or lower altitudes, which will reduce the comfort of local travel and seriously affect the travel experience of tourists. In this case, tourists will look for tourist destinations that meet their psychological expectations. H2 and H5 enterprises believe that climate warming will damage the local tourism resources and reduce the tourism quality of tourists, especially in the tourism areas with high latitude and altitude and cool climate. Through investigating the recent tourism data and statistical reports of the enterprises interviewed, it is found that global warming will affect the tourism climate comfort index of different regions, and make

the tourism climate comfortable areas transfer. This will have two effects. On the one hand, severely cold regions have become more attractive for tourism due to the temperate climate. As the climate becomes more pleasant, people from relevant local countries will be more inclined to travel domestically and reduce outbound travel; On the other hand, warm areas are less attractive due to the rising temperature, which makes the residents of this region more likely to travel abroad than to travel in their own countries. In the interview, H6, H7 and H12 enterprises have repeatedly stated that, in particular, the tourism volume in southern China decreased significantly in summer, while the number of tourists in northern China increased slightly in summer. However, customers prefer to travel abroad in summer rather than domestic areas. From the above analysis, it can be seen that climate warming will promote tourists to tourist destinations in cool areas such as high altitudes and high latitudes.

In fact, it is precisely because climate warming will lead to such a great impact on tourism destinations, which indirectly leads to the attraction of tourism destinations and has a greater impact on travel agencies. In fact, in addition to the above impacts, climate warming will also have other impacts on the choice of tourists. For example, H4 and H11 enterprises mentioned that climate warming will lead to glacier melting, sea level rise, and even extreme climate phenomena, which may greatly damage the tourism resources and transportation facilities of tourist destinations, make it more difficult for tourists to reach the tourist destination, and also affect the tourism demand; Moreover, due to the increase of uncertain factors in the occurrence of disasters due to extreme weather events, some tourists who are afraid of suffering from adverse weather and life risks and affect their travel experience will change their choices of tourist destinations. All the travel agencies interviewed mentioned that after the broadcast of the documentary “captain of China”, the number of tourists visiting Tibet showed a decreasing trend. It can be seen that climate warming has affected tourists’ choice of destinations, and indirectly brought impact and challenges that can not be ignored for travel agencies. Therefore, it is necessary to build a digital platform for travel agencies to realize the digital innovation and sustainable development of travel agencies in a warming environment.

4 Findings

Climate warming will lead to changes in tourist flow. If travel agencies do not analyze or even change the operation mode, it may cause great losses to enterprises[10-13]. In order to cope with the huge impact of climate warming on the tourism industry and travel agencies, travel agencies must adapt to the times, from the perspective of tourists, and grasp the needs of tourists. Through the digital innovation of travel agencies, to realize their own development in a warming environment, it is necessary to build a digital platform model for travel agencies under the new Internet environment to analyze the above content. The digital innovation of its travel agency mainly has two functions, user-generated content and online social networks, including the following four functional modules.

4.1 Travel agency e-commerce function module

In the context of climate warming, tourist destinations will undergo some changes. For this reason, it is necessary to design e-commerce functional modules of travel agencies to provide tourists with better services, thereby promoting the development of travel agencies, which mainly include the following two modules.

4.1.1 Online marketing function module

In the current background of rapid development of information technology, the network with a huge amount of data is changing the entire information service industry. The information of tourism industry is very rich. In order to win more tourists, it is necessary to provide more personalized information customization service for visitors to the website. To this end, can build an information publishing platform to publish the selection options of current tourist destinations, or establish an advanced search engine to release personalized or thematic tourism product information by tourism dealers and operators, and obtain necessary feedback from tourism demanders, In order to make timely and efficient response to the published content, enhance the popularity of visitors to travel agencies, so as to complete the online marketing on the web page and promote the completion of orders. Among the 13 travel agencies interviewed, H9 enterprises have worked for 11 years, but have not established branches and outbound travel business. The company mainly collects massive data of domestic tourism of tourists and analyzes them online to build personalized tourism customized service suitable for domestic market and provide online marketing and after-sales service. Even

if it lacks outbound travel business, it can serve any travelers who trade through the online platform, and tourists with demand can find out the enterprise in time when choosing a travel agency, understand the enterprise information and operation history, obtain the true evaluation of other customers who have already consumed, and then trust and choose the enterprise. It shows that H9 enterprises can effectively promote tourists' transaction and obtain service evaluation by virtue of advanced search engine.

4.1.2 Personalized service function module

Despite the strong impact of climate warming on the tourism industry, the tourism industry is still a multi-faceted industry including "food, housing, transportation, tourism, shopping, entertainment, health, leisure and sports", which has a huge market demand. In the current climate warming environment, H3 and H8 enterprises think that how to use various measures to meet the needs of tourists and promote the transaction of orders is one of the important issues that travel agencies need to consider. It is also a necessary condition for travel agencies to survive and develop in the current context. Therefore, according to the characteristics of relevant tourism products, travel agencies can provide more suitable search engines for tourists to meet their psychological expectations and needs, and help them formulate more perfect and personalized tourism plans, so as to meet the needs of tourists to the greatest extent.

4.2 Word of mouth function module

All the enterprises interviewed said that good word-of-mouth is one of the most important conditions for an enterprise to develop for a long time. Due to the warming of the climate, tourists' previous travel experience is no longer applicable. In order to get a better travel experience, it is necessary to resort to the help of travel agencies. However, due to the uneven quality of travel agencies, it is difficult to generate a good reputation. Therefore, it is necessary to build a word-of-mouth function module to help travel agencies form good word-of-mouth. This module can build a good word-of-mouth communication channel between all parties, so as to improve the word-of-mouth of tourism products, maximize the network efficiency, and lay the foundation for the establishment of travel agency credit evaluation system. Moreover, the establishment of this module can help tourists to make more reasonable travel plans and further improve the

cumulative effect of word-of-mouth.

4.3 Network community function module

The social network of tourism demanders is also an important source of word-of-mouth. In the climate warming environment, in order to get more tourists to choose, it is necessary to build network community function modules to obtain good word-of-mouth, so as to promote the development of travel agencies. The most important part of this function module is that it sets up travel agency community, tour guide community and tourist demander community comprehensively, which makes them form a unified whole and fully stimulates the important role of tour guide in promoting the development of travel agency. This is because the status of tour guides in the core interest groups of tour groups in the domestic tourism industry has not been paid attention to for a long time, and it is difficult to mobilize the enthusiasm of tour guides. However, in this functional module, the autonomy of tour guides has been better played, and their enthusiasm has been effectively mobilized, which improves the quality of tour guide service and direct communication with tourism demanders. To a certain extent, it can solve the tourism problems of those who have tourism needs and promote the volume of orders.

4.4 Online transaction payment and security system function module

All the travel agencies interviewed can realize the online transaction payment function, and the interviewed enterprises said that online transactions accounted for more than 70% of the total turnover. The function module of online transaction payment and guarantee system can fully guarantee the payment and income security of tourists and travel agencies. It is an integral part of the whole platform. It is created on the basis of the existing payment platform. Making full use of the security of the current payment platform, can also innovate the payment transaction method according to the characteristics of travel products, that is, the transaction payment is completed in several times, especially the deposit payment method not only protects the interests of tourism demanders. Moreover, it can also promote the development of travel agencies, greatly reduce the risk of tourists buying tourism products, and solve the problem of difficult to protect their own interests brought by travel products for consumers[14-16]. Therefore, from this point of view, the establishment of this module has greatly promoted

the good development of travel agencies in today's warming climate.

In order to enable travel agencies to develop rapidly in the global warming environment, it is necessary not only to build the above tourism digital platform, but also to provide them with the basic operation strategy of the travel agency digital platform. In order to enhance the reputation and influence of travel agencies, after interviewing 13 travel agencies, this paper summarizes the operation strategies of digital platform of travel agencies, mainly including the following three aspects.

The e-commerce function module is the core of the entire travel agency's digital platform model, and the smooth operation of this module must be ensured. The e-commerce function module of travel agency is an important platform for travel agency to provide necessary information for tourism demanders. It reflects the relationship between product supply and demand and its normal operation can become an important bridge link between travel agencies and tourism demanders. Online marketing of travel agencies and personalized service customization of tourism demanders are the result of active communication between travel demanders and travel agencies in order to obtain better travel experience, which must be ensured to be unblocked. At the same time, in order to make the module work better, the fourth main module provides an important support.

The extended word-of-mouth function is an important reference for tourism demanders to make their own travel plans. It is necessary to ensure the smooth operation of the function and provide certain reference for consumers to make relevant decisions. This functional module can make use of the word-of-mouth effect to make consumers have a more intuitive understanding of tourist destinations and promote the increase of tourist numbers. Not only that, it can also provide consumers with more abundant tourism products, tourism plans and travel agencies that meet the needs of consumers, and generate corresponding word-of-mouth evaluation after the end of tourism, which can provide important reference for future tourism demanders. Therefore, it is necessary to extend the function of word of mouth and increase tourists' trust in travel agencies.

Make the network community become the mechanism platform to link the first two modules and enhance the diffusion effect of the first two modules. The online community function module highlights the role of

tour guides to a greater extent, and promotes their enthusiasm. At the same time, it also provides a basis for travel agencies to select target groups and promotes the survival and development level of travel agencies. The platform can produce great utility. For example, travel agencies can provide related packaged travel products or special function products for them or follow groups or individual travelers according to the wishes of travel demanders; Travel agencies can also use this platform to push personalized and thematic product information to tourists; Tourism demanders can also choose suitable products according to their own wishes, so as to maximize their tourism satisfaction; In addition, the platform can also make tourism demanders more intuitive to recognize the advantages and disadvantages of each travel agency, and provide necessary help for their choice; Finally, according to the characteristics of tourism products, its online payment platform reduces the purchase risk of tourists and protects the interests of online tourism product customization. In summary, the coordinated operation of various functional modules of the travel agency's e-commerce platform gives full play to the unique advantages of travel agency's e-commerce control over information flow and capital flow, and establishes a communication bridge between travel agency's e-commerce and travel agency demanders. Travel agency e-commerce can smoothly realize the effective operation of travel agency supply chain under the global warming environment.

5 Conclusion

In the global warming environment, travel agencies are facing major development opportunities and crises. In order to make travel agencies and the travel industry better survive in today's environment, it is necessary to carefully analyze the various effects of global warming on travel agencies. This article interviewed 13 travel agencies, discussed the impact of climate warming on travel agencies from multiple angles, analyzed and tried to give travel agencies' digital innovative strategies to deal with climate warming, in order to provide certain help for the sustainable development of travel agencies.

6 Discussion

In the digital age and the background of global warming, this article provides travel agencies with an analysis of innovative ways to deal with climate change. However, due to various constraints, this article also has certain deficiencies. For example, due to space

issues, the innovative approach of travel agencies has not been analyzed from more aspects. In order to realize the sustainable development of travel agencies in a warming environment, in the future, on the basis of this article, we will analyze more ways to realize the digital innovation of travel agencies, and help travel agencies realize their benefits.

References

- [1] Wang LG, Han YW, Gao J, et al. Tourists' decision-making and experience in the Qinghai-Tibet Plateau in the context of climate change[J]. *Geographical Research*, 2019, 38(09):2314-2329.
- [2] Zeng YX, Zhong LS, Liu HC, et al. The progress and enlightenment of quantitative research on the impact of foreign climate change on tourism enterprises[J]. *Journal of Natural Resources*, 2019, 34(01):205-220.
- [3] Liu J, An KK. Domestic research hotspots and prospects of climate change and tourism: based on bibliometrics and social network analysis[J]. *China Ocean Economy*, 2018(01):240-255.
- [4] Valizadeh M, Khoorani A. An evaluation of climatic conditions pertaining to outdoor tourism in Bandar Abbas, Iran[J]. *International Journal of Biometeorology*, 2020, 64(1):29-37.
- [5] Phillips M R , Jones A L , Thomas T . Climate Change, Coastal Management and Acceptable Risk: Consequences for Tourism[J]. *Journal of Coastal Research*, 2018, 85:1411-1415.
- [6] Martin B, Václav P, Michaela VG, et al. The impact of tourism on extremely visited volcanic island: Link between environmental pollution and transportation modes[J]. *Chemosphere*, 2020, 249: 118-126.
- [7] Xu Y, Ji XM, Shen PP. Reviews on Climate Change and Tourism Research[J]. *Journal of Guangxi Economic Management Cadre College*, 2017, 29(1): 58-64.
- [8] Carvache-Franco M , Segarra-Ona M , Carrascosa-Lopez C . Segmentation and motivations in eco-tourism: The case of a coastal national park[J]. *Ocean & Coastal Management*, 2019, 178(AUG.):104812.1-104812.8.
- [9] Bujosa A , Torres C , Riera A . Framing Decisions in Uncertain Scenarios: An Analysis of Tourist Preferences in the Face of Global Warming[J]. *Ecological Economics*, 2018, 148(JUN.): 36-42.
- [10] Huang X. The impact of climate change on tourism enterprises[J]. *Tourism Overview (the second half of the month)*, 2018(11): 30-31.
- [11] Da Silva M L , Castro R O , Sales A S , et al. Marine debris on beaches of Arraial do Cabo, RJ, Brazil: An important coastal tourist destination[J]. *Marine Pollution Bulletin*, 2018, 130(MAY):153-158.
- [12] Buckley R , Mossaz A . Private conservation funding from wildlife tourism enterprises in sub-Saharan Africa: Conservation marketing beliefs and practices[J]. *Biological Conservation*, 2018, 218: 57-63.
- [13] Zhu X, Liu M. Strategies and Practices of Coastal Tourism

- Enterprises to Address Climate Change[J]. *Ocean Development and Management*, 2016, 33(1):57-64.
- [14] Mihaila D , Bistricean P I , Briciu A E . Assessment of the climate potential for tourism. Case study: the North-East Development Region of Romania[J]. *Theoretical & Applied Climatology*, 2019, 137(1-2):601-622.
- [15] Alejandra R. Enríquez,Angel Bujosa Bestard. Measuring the economic impact of climate-induced environmental changes on sun-and-beach tourism[J]. *Climatic Change*,2020(pre-publish):1-15.
- [16] Zheng J, Zhang RX, Lei S, et al. Study on Impact of Climate Change on Tourism Behavior of Tourists——A Case Study of Qinling Area[J]. *Resource Development & Market*, 2018, 34(07):987-991+1036.