Exploration and Analysis on the Development Path of Smart Tourism in Shandong Province in the Era of Artificial Intelligence

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Abstract. In the new period, China's tourism industry has entered a new stage of popularization and industrialization, the tourism mode has also changed from “scenic spot tourism” to “all-for-one tourism”, and the development of big data, Internet of Things, artificial intelligence, block chain and other new generation of information technology have promoted the transformation of traditional tourism into smart tourism. As a big tourist province, Shandong Province’s smart tourism developed earlier and achieved more; however, there are still some problems, such as insufficient attention, low popularity, and unbalanced development of cities. This paper takes the impact of artificial intelligence on the development of traditional tourism as the breakthrough point and explores the development path of smart tourism in the era of artificial intelligence in the next stage of Shandong Province through analyzing the internal need of smart tourism development in the era of artificial intelligence in Shandong Province.

1. Introduction
Since the first year of artificial intelligence in 2016, a new round of technological and application revolution has been launched around the world. With the AlphaGo man-machine war, artificial intelligence has become a hot word, the curtain of the new era of science and technology has been officially opened, and information revolution will open up an unprecedented new world for mankind. The influence of science and technology on human society will be greater than ever before, global networks and terminal applications connected by the Internet of Things and social and productive relations reshaped by artificial intelligence…In this era of rapid change, science and technology brought new efficiency and new experience to the world, for example, the tourism market was “changed intelligently” due to artificial intelligence, and smart tourism came into being.

2. The Application of Artificial Intelligence in Smart Tourism
Smart tourism is an effective application of tourism embodiment, industrial development and tourism administration based on the Internet of Things technology, artificial intelligence technology, cloud computing and other information technology, and its purpose is to realize the effective integration of tourism resources and provide necessary customized services to users. Among them, artificial intelligence technology becomes the important means of product and service innovation of smart tourism with its outstanding advantages, which are mainly reflected in:

(I) Effective collection and processing as well as accurate push of tourism information. For example, the basic contents of tourism products or services in the database can be effectively collected through the intelligensi of artificial intelligence technology in the travel process of consumers, including the basic condition of tourist destination, the evaluation of the travel products or services from other consumers, traffic conditions in the area, etc. Therefore, the targeted itinerary can be put...
forward according to the needs of consumers and the personalized customization in the travel process of consumers can be realized.

(II) Replace the manual guide, realize self-service interpretation, and improve tourists' sense of experience and interaction. For example, with the development of artificial intelligence technology on overseas trips, the current translation software has achieved a high level of intelligence and informatization. The application form of translation software is no longer limited to dictionary form, and tourists can effectively translate the contents, such as road signs, sounds and menus, which are not easily converted into the dictionary nature with the help of artificial intelligence, so as to provide necessary translation services for tourists on overseas trips.

(III) Realize the reasonable forecast of the number of tourists in the scenic spots and realize the efficient tourism service. Artificial intelligence technology uses rough set approach, genetic algorithm and support vector regression to realize the reasonable analysis of data information, and combines with the relevant information of other intelligent systems to analyze and calculate the tourist density and distribution characteristics within the region, so as to realize the forecast of the number of tourists in the scenic spots.

(IV) Provide reasonable travel route planning for tourists. For example, artificial intelligence technology realize the reasonable planning of tourists' travel routes based on programming, reasoning and problem solving technology in accordance with tourists' travel needs and combining with various information resources, so as to help the nonlocal tourists who are unfamiliar with the tourist sites to travel reasonably. On the one hand, it can avoid wasting time looking for and asking for directions; on the other hand, it can guarantee that self-driving tourists will not miss wonderful contents through the recommendation of artificial intelligence technology.

(V) Provide intelligent management for tourism administration departments at all levels to improve the work efficiency. On the one hand, tourists can timely and accurately reflect the problems in the travel process to the administrative department, so as to improve the administrative department’s processing efficiency of tourist problems; on the other hand, the administrative department also can deliver the important information to tourists and service suppliers, especially the information delivery of highlighting events. Finally, artificial intelligence technology can also help the administrative department to achieve intelligent scheduling and help the efficiency of various management activities.

3. Development Status of Smart Tourism in Shandong Province

As a big tourist province, Shandong’s tourism revenue has been growing. 2017 was a golden year with RMB 55.9 billion of revenue, ranking the highest in the country. In 2017, the total tourism investment was RMB 223.18 billion, accounting for nearly a quarter of Shandong's tourism revenue of RMB 920 billion, so such a high investment has created a good external condition for the development of smart tourism.

Shandong’s smart tourism developed earlier and achieved more. In 2009, Shandong Provincial Tourism Bureau pioneered the development and application of China's tourism digital service system with the opportunity of undertaking the national “863” project and the research project of “development and demonstration of digital tourism service system based on high trusted network”. In 2012, Shandong tourism service hotline 12301 was opened in eight cities including Jinan, and Yantai was selected as one of the first batch of smart tourism pilot cities in China. In 2013, Qingdao was selected as one of the second smart tourism pilot cities in China. Shandong Tourism Administration Net, Hospitable Shandong Net, Shandong Tour Guide Net and Information Net were launched respectively, and the official Microblog of Shandong Tourism Bureau and two WeChat subscription numbers of “Shandong Provincial Tourism Bureau” and “Shandong Tourism Administration Information” were successively opened. In 2015, the Microblog of Shandong Tourism Bureau was selected as the best Microblog of China's tourism bureau.

The development of smart tourism in Shandong is earlier, but the development of cities is unbalanced. Qingdao, Yantai and Weifang have issued the construction planning of “smart tourism cities” before 2015. Weifang, Shandong put forward the “one three three” strategy of smart tourism in 2015, that is to strengthen the top-level design of smart tourism, develop three application systems of smart management, smart service and smart marketing, and construct three guarantees of smart
tourism cloud data center, information network facilities and smart tourism standards and norms, which has an important demonstration and leading role in the whole province. The construction of smart tourism in Qingdao City is committed to improving the satisfaction of tourists, and various scenic spots in the city began the transformation activity of intelligent service function in 2013. Tai’an, Zaozhuang and Dezhou began to construct the Travel Net and developed tourism network marketing business.

4. Existing Problems of Smart Tourism in Shandong Province
The development of Shandong’s smart tourism is in the forefront of the country, but there are still many problems, such as insufficient attention, low popularity, lagging development and imperfect system.

(I) Insufficient attention of government. At present, there are only three cities in Shandong Province that have officially planned and issued special smart tourism planning, and other cities are covered in the “13th five-year plan” for tourism, but the important infrastructure construction related to the future development of tourism is still insufficient. The government is still required to issue relevant special planning, strengthen the top-level design, and complete the tourism supply side and the conversion of old and new driving forces for the transformation of the operation mode and the reform of the development mode of smart tourism.

(II) Low popularity of each scenic spot. In the research of Shandong, it is found that many 4A and 5A scenic spots are equipped with low equipment for smart tourism, many scenic spots only have simple services like online e-ticketing service, the popularization of basic intelligent services such as scenic route, intelligent interpretation, hotel intelligent service and transportation intelligent service is insufficient, and tourists’ experience is poor. The bottleneck of development for smart tourism in some scenic sports is insufficient capital, insufficient professional knowledge of practitioners and high maintenance cost.

(III) The phenomenon of repeated construction with low quality is common. In order to strengthen the information construction of scenic spots, various places set up websites, electronic monitoring, ticket purchasing system and other facilities, and some scenic spots became demonstration points of smart scenic spots through scientific management. However, some scenic spots still blindly buy computers and technology terminal equipment in the absence of planning and design. Equipment purchased by some scenic spots is still idle. The website has been built, but a lot of waste of resources has been caused due to the lack of maintenance.

(IV) Imperfect technology and unsound system. With the advent of mass tourism, meeting the independent travel and the individual service demand of individual tourists is a realistic problem to be solved by the tourism service department. However, at present, the construction of smart tourism in Shandong Province is still in the initial stage, which is still far away from the real “smart”. It lacks corresponding technical support, and the tourism service system is not sound, so it cannot meet the needs of tourists.

5. Construction Way of Smart Tourism in Shandong Province
2013 is called the first year of big data in China, and it is also the first year for China to develop smart city pilot construction relying on big data technology. In 2014, our country launched the special work on smart tourism and kept exploring and moving forward. Compared with the previous tourism informatization, the introduction of new generation of information technology aims at improving tourism service, improving tourism experience, innovating tourism management, optimizing the use of tourism resources, strengthening the competitiveness of tourism enterprises, and improving the government’s governance level of tourism industry, which can be said that the demand of smart tourism under the background of big data is the public value shaping for tourists, enterprises and government. Based on the internal need of smart tourism development under the background of big data, and combined with the actual needs of current supply-side structural reform in China's tourism industry, the development of smart tourism in the next stage of Shandong Province shall include the following aspects:

(I) Strengthen the guiding and supporting role of the government
The government shall build a multi-level integrated management system for global smart tourism, and promote the transformation of tourism industry governance from passive and ex-post management to full process real-time governance. Smart tourism in the era of big data brings tourists a new experience of networked and personalized global tourism smart service, which may not only provide tourism supporting services, but also provide high quality public services of the city during the travel to tourists through the smart service platform of global smart tourism (Travel Information Portal, Global Travel App and Wechat Official Account of Tourism). It requires the government to not only support the construction of smart tourism in policy and play a guiding role, but also to provide financial and technical support for the development of smart tourism and play a supporting role.

At present, Shandong Provincial Tourism Bureau shall issue the special planning document of “smart tourism” and urge the implementation, and carry out the comprehensive construction of smart tourism city in Shandong Province. The overall planning of Shandong’s smart tourism shall aim at improving tourists' smart experience, focus on promoting tourist attractions, travel agencies, hotels and the government, take services, marketing and management as the main axis, and cover the food, housing, travel, tourism, shopping, entertainment industry chain all involved in all industries. 4A and above scenic spots in various places must carry out the infrastructure construction of smart tourism; 3A scenic spots are encouraged to carry out the infrastructure construction of smart tourism; the tourism bureaus of each city shall coordinate the construction of the smart network platform, and the interconnection and mutual use of the basic data platform in the whole province shall be realized.

When conditions permit, the government shall establish smart tourism alliance with enterprises in the form of PPP project. All scenic spots, travel agencies, online travel enterprises, hotels, transportation, entertainment, ICT service providers, telecommunications operators, media and other tourism enterprises in Shandong shall play the enthusiasm for building smart tourism under the guidance and support of the government, strive to complete the construction of smart scenic spot, smart service and smart management during the 13th five-year plan period, give full play to the online operation ability of tourism marketing enterprises and other service subjects, improve the information level and service capability of B2B and B2C travel search tools, travel review websites and new media clients, and improve the smart service ability of tourist hotels and attractions. In a word, the ideal state of smart tourism in Shandong will be realized only when the smart tourism subjects led by the government form an alliance.

(II) Build the service platform for smart tourism

Four platforms of big data application platform, global tourism promotion and marketing platform, global tourism smart service platform and regional tourism certification supervision platform can be set up on the basis of the construction of global tourism cloud platform, government data resources, social data resources, network data resources and enterprise data resources shall be fully integrated, and the network resource pool shall be built through the construction of cloud platform to form the plan database, knowledge database, expert database, case database and geographic information database, which provides personalized quality service for enterprise marketing (real-time release and control of tourism marketing information, enterprise marketing platform), and provide important data guarantee and platform support for tourists enjoying smart services (the online integration of tourism products enriches tourists’ choices, the travel route is planned in advance, and the tourism evaluation system is scientific and standardized) and for government realizing smart governance and regulation.

(III) Build a multi-dimensional and all-round smart tourism marketing system

Shandong’s smart tourism marketing needs to comprehensively build the intelligent tourism marketing application system, develop differentiated and personalized tourism marketing strategy, connect the smart tourism service platform, analyze tourists’ preferences through big data, use website, Microblog, WeChat, we-media and other new media clients to push tourism products to customers, intervene the life of potential customers, drive customers’ demands, provide smart marketing for its tourism decisions, and put an end to the loss of customer information asymmetry. Shandong’s tourism enterprises shall fully operate online, learn the operation mode of OTA online travel agents and e-commerce platforms, develop tourism e-commerce products, build the sales system of smart travel agencies and smart scenic spots, provide OTO services for the sales of tourism products and local characteristic products, and promote the transformation of tourism marketing mode of tourism
enterprises from traditional marketing to big data precision marketing. Taking the micro mall of WeChat platform as an example, the scenic spot can use it as a marketing platform to implant brands in the game, attract customers to participate in and share the activities through rewards, and promote marketing through communication in circle of friends.

6. References

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