Research on Intelligent Tourism Town Based on AI Technology

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Abstract. With the understanding of “intelligent Earth” deepening in everyone’s heart, the combination of intelligence and tourism has become the focus of researches. Today, tourism towns are booming in China, which gradually become new growth point of economy and new highlight of urban and rural overall development. This paper discusses tourism town construction with AI technology, analyses problems and shortcomings in tourism town Intelligence construction under present circumstance of smart tourism development and purposes ways and strategies to construct smart towns.

1. Research Background
When it comes to smart cities, people tend to think about the Internet, the Internet of things, cloud computing, Big Data, mobile Internet and other applied technologies. However, AI technologies are overlooked, such as intelligent manufacturing, intelligent voice control, intelligent household electrical appliance, robots, intelligent terminal, AI, VR and others.

AI, also known as Artificial Intelligence, is a new interdisciplinary subject and intelligence technology developed from interpenetration of multiple subjects, such as computer science, cybernetics, information theory, psychology, linguistics and so on. It studies how machines, especially computers imitate and carry out human behaviors. After decades of development, AI technology grows in many fields and is applied to our daily life and learning process. AI can extract useful information from data sea. With features like fast process of information and high efficiency, AI provides supports to smarter decisions and activities, which can result in improving government public service, enterprises competitiveness and citizen life quality. Thus, it is like an intelligent road to smart cities.

2. AI Technology Applied in Intelligent Tourism
Netizens have become the main force in tourism market, whose consumption need for individualized, quality and experimental tourism urges the combined development of Big Data, AI technology and tourism service. New products and new type of business have resulted from it, such as customized tourism, micro tour guide service, intelligent visitors’ guide. Technology now shares a very strong link with individualization and intelligence of tourism.

Tourists’ fragmentary needs during their trips are growing as well due to the fact that independent tourism has become the main way to tour for the public. At the same time, people now find pure sightseeing not enough and desire more of convenience and sense of achievement during the trip. Take outbound travel as an example. To overcome the language barrier which is usually seen in outbound travel, Baidu, Google, Youdao Translation, Iflytek and some other companies have developed AI technology, such as “Picture Translation”, “Voice Recognition”, “AR Instant Translation”. Translation
devices are more intelligent than ever, which makes outbound independent tourism easier. In addition, intelligent service, such as taking pictures for recognition and translation of words and visitors’ guide, makes travelling more revitalized.

In recent years, growth of tourism demographic dividend has slowed down; refined operation of stock market has become a new direction for market body to work toward. Many hotels and scenic spots uses AI technology to provide better experience for tourists, which is actually a main attraction for tourists. “post-90s generation” and “post-2000 generation” are taking over the main part of tourism market, whose need for intelligent, quality and experimental service drives hotels and scenic areas to apply AI technology more broadly. Those enterprises attempts to give tourists better check-in experiences by face recognition, intelligent tour guides and other high-tech. Scenic spots, museums, entertainment venues apply VR and AR to individualized quality experimental settings, attracting a great number of tourists. Some enterprises put robots in scenes and encourage visitors to interact, which meets the need for individualization and fashion. For example, in the exhibition area of Confucian Culture in Shandong Museum, there applies holography technology to present a sense in which tourists can ask Confucius for direction; in Shandong Art Gallery, AI robots are there to serve as interpreters of famous paintings, which is really fun.

To provide shared quality experience between citizens and tourists, as well as to improve efficiency and profits of services, companies innovate and develop new technology. For example, intelligent customer service are gradually replacing human customer service, which reduce waiting time for tourists while providing instant service. AI incorporates with search engines, providing individualized precise search service to reduce trading time. Intelligent assistants with the help of Big Data technology meet the diversified needs of tourists and lower costs for manpower. Combination of AI and technologies such as Big Data and Cloud Computing digs the characteristics of different customers. Digital marketing method of “one way for everyone” is formed to improve companies’ ability of profits.

In the period of information booming of Internet and mobile Internet, tourists are the producer as well as consumer of information. Tourism companies, with the help of AI combining with Big Data, analyse tourists’ behavior and personality characteristics, consumption preference, and develops new products and business type, new process and supply chain, new business mode. Tourism experience of our nation grows every day. Standard development and large-scale marketing of group tourism couldn’t satisfy tourists’ need, thus, high quality customized tourism then is born and quickly takes over part of the market, for meeting the need of beautiful life of citizens.

We should optimize policy design, promote “tourism + AI” application. The next 5 years is a critical period for global new round of technology reform and industrial Internet development. A increasing number of companies will reconstruct business platform and service system by AI technology and robot learning. Under the circumstance where demographic dividend is weakening, AI is expected to play a key role in intelligent tourism business platform, precise service and better tour experience. Big number of online data in China also brings opportunity for AI development. AI technology has a bright future in tourism.

Regarding to policy making, it’s encouraged to innovate and promote tourism and related industry with 5G and AI technology and to grow as market body through tax, fiscal subsidies and award for good modeling in 5G pilot cities. As to technology, AI combined with Internet, mobile Internet, 5G communication, Internet of things, Big Data and Cloud computing, can realize interconnection of everything and support new tourism scene, products and type of business. As for market body, AI and existing technology can work together to build experimental scene in accordance with main customers, provide intelligent, individualized and convenient chain service. At last, motivations from policy, technology and finance, AI technology can penetrate into more fields and form industrial pattern suitable for people’s need.

3. Problems in Intelligent Construction of Tourism Towns

Tourism town is a new industrial form under the global travel strategy, and is one of the most concerned visiting sites. In a time of “Internet +” and AI development, any traditional or new industry must have contact with the Internet. It is the same with one scenic spot as well as tourism towns.
Today, intelligent tourism, intelligent cities and characteristic towns are all booming and tend to fuse together. Therefore, the construction of characteristic towns must consider the application of AI technology and Internet from the start. However, right now there are still many problems in the construction.

1. Tourists: Tourism towns’ competitiveness is weakened because of superficial understanding of regional culture, lack of publicity and little connection with other spots and surrounding resources; Tourism lacks of innovation, quality and comfort; related tourism souvenirs and featured diet have low brand effect.

2. Enterprises: Companies’ orientation is not clear. The distribution is dotted instead of lines, and scale effect never took shape; as for management, there is no integrated management layout. Information technology isn’t effectively used in scientific management.

3. Government: There isn’t enough platforms that can promote local scenic spots. In addition, there is no complete system for public transit facilities.

Therefore, to reform management of intelligent tourism in tourism towns is to construct infrastructure in a standardized and intelligent way with sets of facilities. That is to say, intelligent method must be applied, following tendency of development.

4. Specific Strategy for Intelligent Construction of Tourism Towns

4.1. Intelligent Facilities Construction

Intelligent construction of tourism towns can be demonstrated from every moment of entering the towns. For example, when previewing town information online, intelligent travel application, WeChat public accounts and PC port can bond with existing E-map and VR technology to build perceptibility ahead on Internet; after arriving at the towns, tourists can scan QR code in the areas using their phones, then they will get VR guide. A 3D panorama tourist map is presented before tourists’ eyes; at landmarks there set electric instruction screens or intelligent touch panels to provide convenience to tourists. Through intelligent panels tourists can know where they are and see the whole view of towns, which give tourists a purpose in tour. Inside the towns, there are QR codes that tourists can scan for voice instruction and relevant knowledge in a convenient manner. Whole-views shot by drones are presented on electric screens, tourists can know about the towns through them and find their interested spots; robots put in the towns can automatically catch and take pictures of smiling tourists, which will be sent to VIP customers as souvenirs. Wireless network, cameras and solar energy panels are to be installed in the towns, in which way 80% of energy can be saved. Let alone full coverage of wireless network in scenic areas, air quality tests, camera surveillance and so on. All information will be collected and sent to database for later more detailed analysis.

4.2. Intelligent Management of Staff

Construction of characteristic towns is based on convenient geographical location and transportation facilities, cultural resources and unique construction plan. “One big web, one platform, one center” is the frame to build “intelligent leisure travel destination” linking online and offline. “One big web” means full coverage of wireless network; “one platform” is the “020 fusion business mode” of e-commerce; “one center” refers to the after sale center that integrates online customer service, offline logistics distribution and operation management. The idea is to construct an intelligent system of integrated tourism service under wireless network. At present, intelligent towns do not have full coverage of wireless network in all areas or multi-screen interaction system between tourists and operators. Therefore, the subsequent construction should focus on this aspect, providing free wireless Internet service during tourists’ travel, improving their tourism experience, at the same time providing mobile Internet access for platform operations. Carrying out data mining and analysis on tourists’ online behaviors and providing accurate positioning marketing for businesses with rational plan of resources based on market orientation are to make the content and development of products more market-oriented. At the same time, providing to the operator management terminal and the towns’ intelligent equipment network connectivity in order to improve the towns’ intelligence level. The development and construction of intelligent towns can meet the needs of tourists through the
comprehensive use of modern science and technology and serve tourists efficiently, conveniently and intelligently. The intelligence of tourism towns is also reflected in the staff management, improving work enthusiasm through online evaluation; intelligent electronic work card is also an efficient way to manage employees, as well as to ensure the work content and service quality of employees. Through the popularization and cooperation of intelligent equipment, tourists are better served.

4.3. Intelligent Life
Today, AI technology is applied to intelligent cities’ construction and its application range is ever growing, with innovation in its techniques. People gather and live in characteristic towns, which is why intelligent life style should be promoted there. Entity service robots can interact with humans in ways of word, voice, somatosensory, face recognition, fingerprint and so on; Intelligent major’s desk, based on intelligent informational ecosystem, connects every departure and eliminates data barriers. In this way, policy makers of the cities can know well of problems springing in every link in the process of building intelligent cities; face recognition ensures video safety, intelligent warning and avoidance of same situation; Underwater robots can automatically guide itself and navigate in its way to scan for pipeline crevices and other underwater observation programs. What’s more, there are self-driving planes and boats and gas detectors. Those AI devices play an vital role in technology support to construction of intelligent cities and towns.

5. Conclusion
The construction of intelligent tourism towns, aimed for modernization, technicalization and intelligentization, through transformation and upgrading to intelligent towns, urges the fusion of traditional operation management and the Internet. Tourism industrial value chain is reconstructed and intelligent systems are build for towns, so that visitors’ tour experience is improved. In 2019, Yunnan Tengyun Information Industry Co Ltd started its business in is field. The first period of Digitization of Old town of Lijiang has completed. There established and completed detailed guide and instruction, intelligent consumption, intelligent hotels, intelligent open kitchens and blockchain of food traceability. In addition, there is individualized extension of “Digital Cultural Town Solution”, in which way improved plan for construction of intelligent characteristic towns. What’s more, mini application of “Shaxi Traveling Bag”, intelligent home-stay with face recognition, revivification of intangible cultural heritage -- Rural Opera of Bai Nationality via 5G and AR technology. Meanwhile in aspect of intelligent management, intelligent service and innovation, an overall upgrading solution is brought up as well. Tengyun company showed through its own practice that AI can be well applied to the construction of intelligent tourism towns. Big data, cloud computing, Internet of things, AI technology should be included in characteristic towns, along with the growth of global travel, intelligent travel, digitization and platform operation to accurate the process of construction and to bring up solutions for it.

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7. References
[1] Xu Fengchao. Intelligent Towns Are Standard Equipped For Characteristic Towns [J]. China Real Estate, 2018(08): 54-57.
[2] Zhang Weiya, Xu Tingting. New Development of Towns of Intangible Cultural Heritage In View of Intelligent Economy [J]. Business Economy, 2019 (01): 52-55.
[3] Peng Diefei, Long Hongming. Research on Service System and Solution of Intelligent Travel In Characteristic Towns Orientated By Tourists’ Experience -- Take Xunlong River Eco-Art Town As example [J]. Journal of Hu'an Finance and Economics University, 2018 (03): 73-79.
[4]  Zhang You. Research on Intelligent Development of Leisure Farm Based on Intelligent Travel [J]. The Farmers Consultant, 2018 (02): 40-41.