Platform Construction and Application Research Based on the Smarter Tourism TMCA System

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Abstract — **Domestic scenic spots during the golden week holiday lots of passengers flow and the scenic spot service behind the conflict in China has become management difficulties. Domestic and abroad as the new concept "smarter tourism" is put forward and smart scenic area construction, smarter tourism in the national informatization construction of scenic spots are mentioned on the agenda, it provides a practical and feasible to solve the contradiction; Based on this, the article in the understanding of the origin and development of international and domestic tourism intelligent, on the basis of theory was proposed based on the Internet of Things, Mobile Communication, Cloud Computing and artificial intelligence technology (AIT) consisting of four main core level IMCA system and the system on the platform of bamboo sea scenic spot construction and use.**

Keywords - smarter tourism; TMCA system; smart scenic area; scenic spot mangament

I. THE ORIGIN AND CONCEPT OF SMARTER TOURISM

A. The Origin of Smarter Tourism

The concept of the wisdom tourism stems from the Planet Smarter and is being part of series of Cities Smarter projects in China. International Business Machine (IBM) first proposed the concept of "smart earth", and pointed out that the core of the wisdom of the earth is to change the way that the government, companies and people interact with each other through the use of a new generation of information technology, so as to improve the efficiency, flexibility and speed of response[1]. IBM proposed the concept of the Planet Smarter and the City Smarter is to realize the wisdom of urban management by using the new concept of the new generation of computer information theory, to benefit the people to provide a fast and comfortable new concept of urban life, and maximize the sustainable development of natural ecology. The City Smarter is the fourth science and technology revolution in the history of human science and technology, the world science and technology revolution and a major breakthrough. Using the intelligence of technology, the construction of smart city, is the world's urban development trends and characteristics.

Smart city system of the main have the United States, Singapore, South Korea and other countries, the use of the direction has been widely used in the urban transport logistics, such as Korean Personal Travel Assistant project (PTA)[2], Phone Application Smart (the United States University of South Florida research) are now more mature use; domestic smart city in China has been included in the "Twelfth Five Year" plan, including Shanghai, Nanjing, Suzhou, Hefei and other large and medium cities are based on their actual situation launched smart city development strategy[3].

Smarter tourism is an integral part of wisdom urban tourism, and is different from "tourism" of smart city. Travel behavior does not necessarily occur in the city, smarter tourism is more extensive than tourism under the smart tourist. Smarter tourism is also using a new generation and communication technologies, will be achieved from the public, business, government and other massive amounts of data information intelligent interaction, for the future of the new tourism.

B. The Concept of Smarter Tourism

As the "wisdom tourism" was introduced in recent years, the concept has not yet formed a unified definition. Professor Lingyun Zhang in his "the basic concept and theoretical system of tourism", a comprehensive overview of the 7 scholars on the concept of "wisdom tourism", pointed out that the essence of Intelligent Tourism is the application of intelligent technology in the tourism industry, which is to enhance the tourism service, improve the tourism experience, innovate the tourism management, optimize the utilization of tourism resources, enhance the competitiveness of the tourism industry, improve the management level of tourism industry, and expand the scale of the industry[4]. In addition to this, Zhu Zhu and Xin Zhang also made a detailed exposition of the concept, the concept of Intelligent Tourism is through the wisdom of tourism management platform, using the tourism resources of various countries, with cloud computing and networking technology, to achieve the intensive, intelligent, unified management[5]. This paper is based on the concept of Lingyun Zhang and Zhu Zhu's concept of wisdom tourism, that the wisdom of tourism is the use of cloud computing and networking technology and other information communication technology, to create a "smart" tourism management platform, so that tourists and tourism managers and tourism enterprises in this platform to

achieve intelligent interactive information of all mass tourism management model.

C. The Smarter Tourism Status Quo at Home and Abroad

So far, there is no such professional vocabulary, but foreign computer network technology is developing rapidly, many information technology related business enterprises have applied information technology to the specific practice of tourism, such as the European Union as early as in 2001 to create user-friendly personalized mobile travel services project; South Korea Tourism Bureau of Mobile Tourism Information Service project[6]; Japan's NTT DoCoMo company "i-mode" phone service project[7].

Domestic coastal areas of Shanghai, Zhejiang has begun to study, a small number of scenic areas (such as Mount Huangshan, Anhui) began to carry out the initial construction. National Tourism Bureau held a meeting and announced the national 22 scenic spots for the national Smarter Tourism Scenic pilot units also opened the smarter tourism scenic area construction. And the "Smarter tourism" written in the twelfth five year tourism development plan. In December 2012, the National Tourism Bureau of the second batch of the list of pilot cities of Smarter tourism, the smarter tourism pilot cities has reached 33. Smart travel pilot cities in the integration of information technology, urbanization, modernization and urban and rural integration and other content, and will start the first Zhenjiang Jiangsu as a pilot, set up the national intelligence tourism service center". Such as Shanghai tourist oriented provides based on intelligent mobile terminal, including tour guide and navigation, navigation and other services "smart guide" [8]. At the same time, the Smarter tourism has also been the domestic academic community's attention, Southeast University to build the Smart Toursim experimental platform, to achieve a multi discipline cross, scientific research and application integration.

II. THE BASIC FRAMEWORK OF TMCA INTELLIGENT TRAVEL SYSTEM

Smarter tourism Based on computer information technology has brought a new cross-boundary theory, which is based on the theory of information communication. Architecture is based on Internet of things, mobile Communication, cloud computing and artificial intelligence (AIT) four key elements, based on the information technology based on the above four elements is the core technology of intelligent tourism.

A. Application Model of TMCA Intelligent Travel System

At present, the main service object of Smarter tourism is divided into three categories: the public; the tourism management department; the tourism enterprise. It is different from the traditional information technology application in the domestic tourist attractions. It is the permanent resident of the tourist destination and the tourists into the unified object. That is, the public individual, which can not only provide services for tourists, but also serve the permanent residence of the tourist destination.

The TMCA four core of the Smarter tourism can not be isolated and scattered, must complement each other, to form a general framework for the smarter tourism model, said TMCA system based on intelligent management and exchange of scenic.(Figure 1)
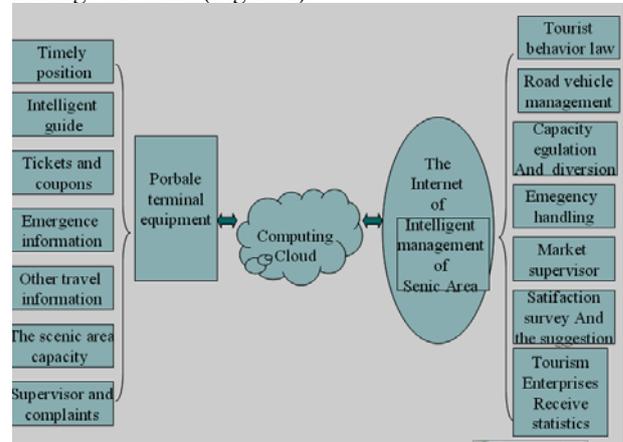

Figure 1 Intelligent management and exchange of scenic area based on TMCA system

B. TMCA smart travel system, the actual use of objects

(1) Yibin Bamboo Sea scenic spot management

1) Bamboo Sea scenic area is the national 4A level scenic area, is actively declare the national 5A leve scenic area. In Sichuan Province, the smarter tourism is still in a relatively backward level, and the national tourist attractions intelligent information system development is relatively lagging behind the status quo. Area of information technology infrastructure is relatively weak. Tourism resources database has not been built, the lack of appropriate technology platform and management standards. Bamboo Sea scenic area administrative jurisdiction of Yibin city tourism resources is currently lack of unified information exchange management platform, has not yet achieved the collection and collation of tourism resources, data and information automatic storage and intelligent information update.

2) Leadership decision-making level is still in a relatively primitive extensive experience management, has not entered the precise digital control of information technology management level, the lack of effective information technology support. For the golden week and other large fake period of tidal flow, although the establishment of emergency plans and emergency leading group, but all belong to the passive solution, simply to increase investment in human resources to deal with the problem. For the number of tourists and the scenic area real-time information and other related management must be timely and appropriate, accurate, comprehensive and effective access to.

3) Yibin city for the construction of the smarter tourism of the various talents needed, proficient in TMCA technology such as the Internet of things, cloud computing, mobile, Internet and other relevant professional team is relatively scarce.

(2) Peak traffic analysis of Yibin Bamboo Sea scenic spot

In the previous research, the author in order to do a detailed data for the construction of the TMCA intelligent travel system, the Bamboo Sea scenic area from 2009 to 2012,the three years before and after the National Day golden week 10, tourists curve chart analysis has been done for the passenger flow data.
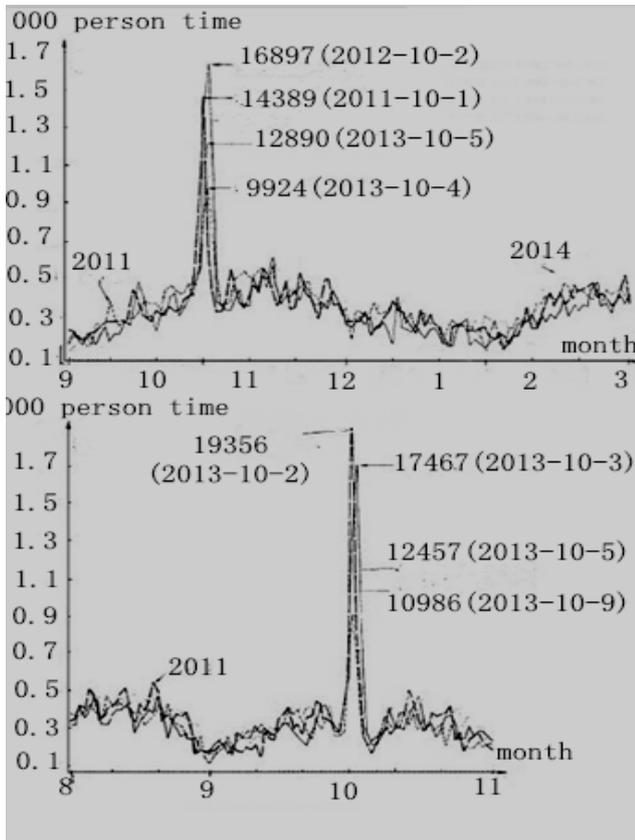

Figure2.Bamboo sea tourist visitors passenger flow graph

From the graph may safely draw a conclusion that:

1) three years of annual tourist traffic daily distribution curve is basically close.

2) in the same year and month of the year in three years, the peak of the tourist flow is close to the date of the year.

3) during the golden week of the highest peak of the traffic flow, the first three days were significantly more than four days off.

4) during the national day, the highest passenger flow rate during the National Day second and third days.

Yibin Bamboo Sea Scenic Area Traffic because of the annual difference and difference, but the magnitude of the difference is very small; the flow of visitors each year non holiday period, distribution curve of three elements: wavelength, wave height, wave steepness is by roughly equal to that of the long wave is connected. Golden week during the national day of the first three days before the peak wavelength, which is the first second days of the three days

for the highest peak wavelength. Similar to those from 2009-2012 and three long wave form, visitors except for golden week, usually on the distribution graph, the trend is basically the same, generally is the shape of the "three peak two valley". How to cut the peak and fill the valley is a difficult problem of the TMCA intelligent travel system.

(3) Analysis of Bamboo Sea scenic spot actual demand

When the author investigated in the Bamboo Sea scenic spot, the need to put forward the basic covering several categories:

1) To obtain accurate information, hoping to grasp the peak period of peak wavelength in the tourist golden week, to understand the distribution and quantity of tourists in the scenic area, as well as the number of visitors to the scenic area.

2) To find the problem in time, how to effectively discover and quickly ease congestion point? To realize the effective treatment of the tourism complaints and the quality of tourism.

3) To solve the problem in time, how to grasp the timely information of the tourists, the staff and the tourism service enterprises in the scenic spot, and quickly solve the unexpected events.

4) The coordination of various departments, and how to achieve timely information and tourism related functional departments to determine the analysis, rapid release of early warning mechanism, as far as possible to avoid the golden week may occur, improve the overall management level of the emergency scenic spot, to protect the tourist attractions tourism security.

III. CONSTRUCTION OF TMCA SYSTEM PLATFORM

From the point of view of information technology, the Internet of Things is the information exchange and sharing; the Cloud Computing is the application model of information; the Artificial Intelligence (AIT) is the method of information analysis. Mobile Communication is a part of the information system, which is a part of the information system.

The construction mode based on TMCA system platform can be used in the SaaS mode (Software-as-a-service), which is the most popular international software industry. Foreign called SaaS, the domestic called software operation service mode, referred to as soft mode.

Based on TMCA system platform of information management in the SaaS operation mode, can help operators to effectively circumvent the traditional software operation mode of investment cycle long, one-time investment huge, construction failure according to a huge loss of risk; traditional software development operation mode requires 1-2 years, and SaaS mode software project can solve the problem in three months, operators do not need to hardware such as: server, disk array cabinet, trunk optical fiber access, etc., also do not need to invest large sums of money in the purchase of licensed software. Based on the TMCA system platform of scenic information management SaaS mode is not limited by the operator of the site, only need any time and place can be safely access Internet can through PDA,

smart phones, computers and other access terminal. Compared with traditional software development of SaaS Model in the post service software in the system upgrade, customer classified data transmission and all levels of incomparable advantages.

Based on the TMCA system platform(Figure 3) using SaaS operating mode of intelligent travel support service system, to remove the key technology, cloud computing, artificial intelligence, mobile communication, but also the geographic remote sensing technology, global positioning technology, multi database technology, data mining technology, virtual reality technology, multimedia technology and other related industries, the whole system of Intelligent Tourism provides a new concept of technical support, so that the Smarter tourism.
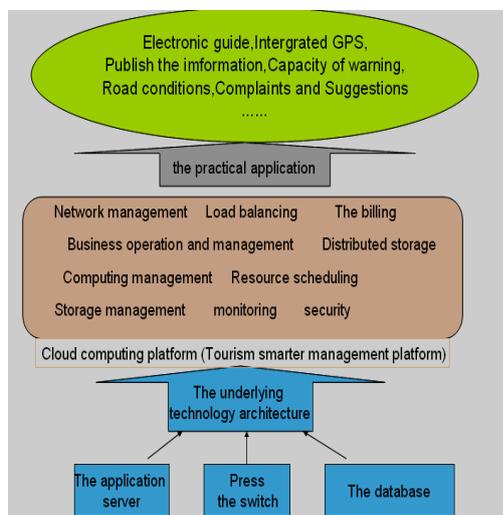

Figure 3 TMCA system architecture model of Smarter tourism management platform

A.   Public Server Based on TMCA System Platform

Starting from the angle of public service ordinary tourists, the wisdom of tourism include navigation, tour guide, shopping guide four basic functions. The main navigation satellite global positioning system GPS American, domestic Beidou navigation system will be put into commercial use; through satellite positioning system, visitors can be very simple to determine their position in determining their own position, at the same time, the mobile phone terminal APP or computer terminal of the interactive menu page will display all the tourist information out of the initiative the perimeter, including the six elements of tourism attractions, hotels, catering, entertainment and other information node content; especially for timely information flow display, automatically adjust their tourism activities of tourists can be based on these information to make the tour planning time, take the initiative to avoid peak congestion. Consciously avoid the special case of the capacity of the scenic area.

In addition to the basic features, visitors can also through the TMCA system to find their own interest in tourism nodes, with the media access to the interest of the node map navigation, text, voice, video virtual tourism, user micro channel feedback information, product booking payment, etc., and submit a virtual travel route planning module, in the public server or computer to submit the starting point and destination, you can get the best solution and travel route proposal. If you are not satisfied with the automatic selection scheme, there is a higher request, you can manually select the interest nodes to carry out advanced planning. If visitors feel that the lack of planning in the early stage, the travel plan can be directly modified by the TMCA system to book their own new plan to the tourism product, so that the next step will be to modify and develop the travel itinerary, information at any time to maintain the smooth, the travel plan has adequate access to information, and do not have to worry about tourism information is not free to cause a variety of unpredictable crisis.

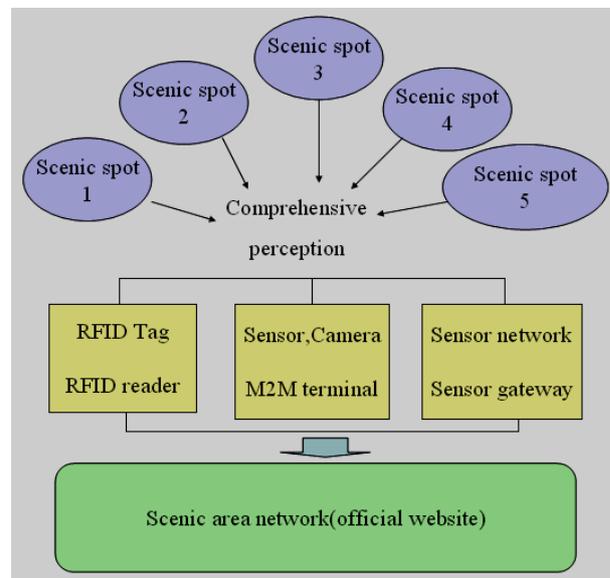### B.   Scenic area based on TMCA system platform

Figure 4. TMCA Bamboo Sea tourist area service system platform interface diagram

Zhouzhuang is located in the hinterland of Suzhou and Shanghai, which is known as the first water village in the south of the Yangtze river. It is one of the more mature tourist attractions in our country, and its information construction is in a leading position in the whole country.

At present, there are some cases in the domestic scenic area management platform, such as Huang Tai, Bao Jigang, who are the Zhouzhuang scenic spot as the prototype, the author based on the mature experience based on the TMCA system to modify the management needs of the Bamboo Sea scenic area management system.

1) After the establishment of the TMCA system, port allows smart phones, RFID, IPD, two-dimensional code, seamless access to the perceived terminal can effectively and

timely access to the Bamboo Sea scenic area, visitors and scenic spots, and can achieve the visual and efficient management of visitors and vehicles. This model can be used as an example. The management system is based on M2M terminal. TMCA scenic spots system server can be scenic spots within the global scope of the security system for seamless link, to upgrade the scenic spot is more professional and efficient security system. Environmental detection system in TMCA system can also be used to monitor the geological disasters, landslides, river water pollution and other conditions, but also can effectively manage the key cultural relics, monuments and other resources in the area of management.

2) TMCA scenic spots system server is established, scenic spots in the multimedia exhibition center, using modern information technology of sound, light, electricity and other a variety of ways: large screen projector, scenic simulation equipment, scenic real virtual sandbox, interactive games, such as the new electronic equipment. For tourists can provide all related services for the six elements of tourism industry chain, can live in to get the discount coupons, complaints promptly accept all types of scenic spots, timely resolution of tourists demand, all-round improve service capacity of the scenic spot.

3) After the establishment of the TMCA system, visitors can enter the scenic area through the Internet to easily achieve virtual tourism, and some of the time, economic, security, cultural relics protection, weather conditions and other temporary not open to the scenic spots, can also be achieved through this way to visit the virtual tourist attractions, visitors can also participate in the system of virtual tourism and micro channel and micro blog. Four two dial a thousand pounds of free advertising effectiveness.

C. The Government Management Server Based on TMCA System

The government management server platform perception layer requires a rich interface, allowing the system within the limits of authority within the scope of the smart phone, RFID, IPD, two-dimensional code, camera and other sensors or intelligent terminal device dynamic seamless access, and allows for other ways such as Zigbee, blue tooth, WSN, etc.. At the level of the cloud platform, the system supports the function and the application of the system is divided into private resources (hardware infrastructure), virtualization layer, management layer and service layer. The construction of hardware supporting platform. Cloud platform layer of the resource virtualization is now unified management, unified scheduling, security access and access management, etc., so that the class application of cloud resources balance. Ultimately to visitors, businesses, hotels, etc. to provide SaaS services.

1) Based on TMCA system core cloud platform, we must first build public service platform portal, realize multi lingual (Chinese, English, Korean, Japanese, Russian, etc.) to provide hotel rooms, air tickets, travel agents and other online booking services, such as hotel rooms, air tickets, travel agents and other online booking services, the main

scenic spots, Gaestgiveriet Hotel, tourism routes, characteristic specialty shopping, etc.

2) Based on the core cloud platform of TMCA system, the need to build a data exchange operations center and call center. To provide a data exchange and operation service based on this platform for the Intelligent Tourism in the whole Yibin city. The whole system needs to integrate GPS, electronic tour guide and the city's tourism enterprise information system, integrated into a complete system of integrated tourism service information platform. Relying on the TMCA system platform, in the tourism enterprises to install the sensor equipment, building a sound regulatory system, the integration of the city's tourism related information in real-time publishing on the platform of the government management system, the individual nodes in each individual node units such as hotels, travel agencies and other places to provide fixed or mobile terminal, to facilitate real-time access to travel information. TCMA system can automatically analyze and judge the location of visitors, the number of visitors, the destination and so on, and the data is transmitted to the server of IMCA system in time.

3) TMCA system based on the core of the cloud platform, the functional departments of the internal information system to integrate various tourism related departments, such as public security system, police system, fire control system, the monitoring system of the scenic area. Led by the government departments, according to each unit classified level interface to access restricted permissions. The internal LAN of the urban tourism related departments is integrated into the core cloud platform based on the IMCA system, so that the cloud platform database system can realize the timely perception, rapid assessment, analysis and judgment, and put forward a series of solutions to solve the problem. The server in the core cloud platform sends out the alarm without delay and sends out solutions to the individual server, such as the intelligent mobile phone, computer, micro letter, telephone, SMS, etc.. The speed of this kind of rapid response is very convenient for the management of the government to manage the timeliness, the timeliness and the high speed of dealing with the unexpected events. Shorten the time period from the government to receive the report and the assessment of the tourism emergencies. Can effectively respond to the rapid spread of the Internet in the era of micro blog, improve the government's tourism management service level, improve the government management of tourism administrative influence, and reshape the image.

IV. CONCLUSION

Whether from the public use, or from the perspective of the scenic side and the government management side, can be found, the greatest smarter tourism management revolution is the real realization of real-time, whether it is the user of the tourism products, operators or managers can ensure the authenticity and accuracy of information, so as to effectively avoid the mistakes of management. This is the biggest bottleneck and difficult problem in the traditional tourist attractions management, which leads to the occurrence of malignant group events in the golden week. Using the

wisdom of tourism can be a real solution to this critical issue from the source. At present, the wisdom of tourism is no longer a nothingness concept, support the wisdom of tourism technology gradually mature and perfect, the policy environment is becoming more and more optimized, to create a smart travel time has come.

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