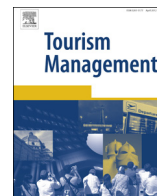




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The concept of smart tourism in the context of tourism information services[☆]

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HIGHLIGHTS

- Identifies changing concepts of smart tourism within the Chinese academic literature.
- Proposes the concept that smart tourism has at its core the tourist demand and ubiquitous technology.
- Utilizes the term 'informationization' to describe key aspects of smart tourism.
- Links smart tourism to big data analysis.
- Links smart tourism to Government e-commerce policies.

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ABSTRACT

Smart tourism has become increasingly popular in mainland China. Different types of events and activities have been classified as *smart tourism*, leading to the misuse of the term. What, then, is smart tourism? How to define it? Although researchers have defined the term, there has not been any consensus on a widely accepted interpretation. The definition provided by this study emphasizes smart tourism as an individual tourist support system within the context of information services and an all-encompassing technology. This paper compares the characteristics of both traditional tourist information services and those incorporated in smart tourism. Based on the concepts, recommendations are provided and future research/industrial directions are discussed. For the Chinese tourism market, smart tourism represents a new direction implying a significant influence on tourist destinations, enterprises, and also tourists themselves.

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1. Introduction

Following the popularization of the concept of *Smart Planet* by President Obama in January 2009, Chinese experts later proposed the concept of *Smart Tourism*. In July 2011, Qiwei Shao, director of the China National Tourism Administration (CNTA), officially launched a mission statement to facilitate and advocate smart

tourism in the following decade. It was a milestone in transferring smart tourism from academic conceptualization to industrial practice. CNTA's official announcement of *Beautiful China, 2014 – Year of Smart Tourism* on November 5th, 2013, established *Smart Tourism* as an important initiative in China's tourism policy that was bound to lead the development of smart tourism to a new phase.

After five-years of work, the understanding of domestic experts on smart tourism has developed, and industrial practice keeps rapidly growing. However, an awareness of the theoretical foundations of smart tourism remains unclear. Given this lack of clarity, practices such as *putting previous wine into new bottles* and *rushing headlong into mass action* will simply lead to a new round of inefficient resource allocation and consequent lowered confidence on the part of enterprises and government authorities. Under such

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concept was first proposed in 2009 and then updated in 2012, and represents a common understanding of *smart tourism*, indicating that smart tourism takes the initiative to sense all aspects of information and release it in time for convenient use. The above definition can be used to sustain a view that tourism information serves as an indispensable pillar supporting smart tourism; however, it is not accurate enough, only describing the idea from the perspective of tourism information release and its use. The concept pays excessive attention to the adaptation of technology, overlooking a forward-looking orientation.

Ma believes that smart tourism is characterized by human-oriented, green, scientific and technological innovation. It facilitates the improvement of the quality of tourism services by applying information technologies, such as cloud computing, networking and high-speed communication technology. The emergence of smart tourism has changed people's consumption habits and tourism experience, and it became a popular trend to combine tourism development with scientific and technological progress (Ma & Liu, 2011).

Yao thinks that, through combining modern information technology with tourism services, tourism management and tourism marketing and by putting tourists' interactive experience as the center, it becomes possible for tourism resources and tourism information to be integrated systematically. Such development can be utilized to serve the public, business organizations and government, so helping these organizations enter a new stage of "tourism informationization" (Yao & Lu, 2013).

The definition above highlights the distinct epochal features of smart tourism and indicates the significant changes for tourists who rely on information technology. However, logically, it is not an exact definition, but only a description of smart tourism.

The second definition is the theory of management change as represented by Zhang and Shi. They believe that smart tourism aims at improving tourism services, strengthening tourism experiences, innovating tourism management and optimizing the supply of tourism resources. They perceive the role of smart tourism as enhancing the competitiveness of tourism enterprises, improving the level of tourism industry management, and expanding the scale of the modern engineering industry.

Zhang, Li, and Liu (2012) argue that smart tourism is based on a new generation of information communication technology aimed at meeting the needs of individual tourists for high-quality, satisfying services to realize the common sharing and effective use of tourism resources while promoting the integration of social resources. Shi (2013) believes that smart tourism is a new generation communicational technology that combines cloud computing, networking, and the Internet with personal mobile terminals (3G technology, PDA etc.) and artificial intelligence.

Smart tourism is ideally placed to meet the personalized demand of tourists, improving tourists' satisfaction, while realizing the common sharing and intensive use of resources. However, the proposal fails to solve present definitional problems because it only considers meeting demands, improving quality and tourist satisfaction. Moreover, it seems inappropriate to locate the essential attributes of smart tourism solely within the perspective of managerial change. Finally this approach to the concept of smart tourism primarily describes applications for business practice.

The third approach is the theory of a new type of business tourism suggested by Tang (2012), and the Tourism Bureau of Zhejiang Province (2013). They believe that smart tourism is a new form of tourism business, facing the future to serve the public, business organizations and government sections (Yan, 2012). This point of view focuses on future tourism development and its expectations of the role of new technologies in the tourism industry. This view regards smart tourism as an *advanced form* of tourism

designed to solve problems in many areas.

Tang (2012) believes that smart tourism is an application of networking and intelligent data mining technology applied to tourism experiences, industry development, and administrative management through a systematic integration of each, so further developing and interacting with tourism and information resources. As a result, it is a new form of business facing the future by combining modern information technology with tourism services, tourism management and tourism marketing, and by taking tourists' interactive experiences as a core element, tourism resources and information can be integrated systematically, developed and better utilized to serve the public, enterprises and the government in a new stage of tourism informationization (http://blog.sina.com.cn/s/blog_6da77cdf01016or4.html, 2013). The advantage of this definition lies in its operational explanation and proactive approach. However, the weak point may lie in the tendency to locate smart tourism in a new era of tourism, and paying insufficient attention to the present and actual construction of detailed tourism information, thereby impeding the future development of smart tourism.

Yin (2010) believes that smart tourism needs to embed and equip sensors into tourism enterprises, tourism consumers, tourism management departments, institutions and various tourism businesses, services, and objects relevant to government affairs, and extensively connect all of those to form a *tourism internet of things* (<http://hi.baidu.com/%D2%F3%C7%A7%BA%EC%F1%F6%CC%FD%B4%F3%B5%D8/blog/item/f1153002950c7ae309fa933e.html>, 2010).

The advantage of the definition above is its combining of networking, cloud computing, the Internet and mobile Internet with tourism. This combination can be used to explain smart tourism. However, the definition possesses a deficiency as it regards smart tourism as a single form of tourism. Smart tourism has many forms, but the key to its level of smartness depends on systems, information gathering, analysis, and collection and other relatively invisible elements. Smart tourism includes not only sensors application, data mining (location based service information collation and dissemination), but also other techniques such as positioning technology, the SNS (social network system), and the social network technology applications.

Mo (2013), for his part, believes that smart tourism relies on new information technologies combining the old with the new to build a perception layer, network layer and application layer. It efficiently uses public platforms to provide applications for government, enterprises, tourists and residents, building a highly informationalized modern tourism industry (Mo, 2013). Wen (2011) thinks, from the viewpoint of city management or tourism management, that smart tourism involves every link in the whole tourism industry, including using intelligent technology to complete tourism development and management processes, and to take advantage of the intelligence and information residing in the whole tourism industry (Wen, 2011). With such an analysis of the smart tourism industry chain, the advantages of smart tourism need to be realized at all stages of the industry chain, from product development to the service supply. These two concepts address smart tourism from two perspectives, the whole destination and the entire tourism industry. It places more emphasis on integration, but the concepts are comparatively vague.

One further issue is that this viewpoint leads to high expectations as to what smart tourism can deliver. It promises a dismantling of the traditional sources of tourism information and dissemination, but it may also make smart tourism a new project that only developed regions are able to develop due to the expenses and needs for an information infrastructure. This leaves little or no opportunities to develop smart tourism in the less well developed

parts of the country.

The fifth type is the pragmatism represented by the Davost Intelligence Group, the tourism bureau of Jiangsu province and that of Zhenjiang Municipality. Although the concept of smart tourism emphasizes the application of new technology, it depends, to a large degree, on the changes in modes of tourism development, the levels and types of innovation and the ways of integrating IT with tourism development to better serve that development. These concepts are of significance in developing smart tourism projects and completing relevant tasks. Without an understanding of *smart tourism*, any integration between information technologies and tourism development cannot be put in place – meaning that smart tourism will fail to break traditional rules, will not create a new mode and format of tourism operations, and so fail to become a catalyst for change in tourism development. Consequently, it is impossible for smart tourism become ‘a capstone of tourism informatization’. So far, no substantive breakthrough has been made.

The Davost Intelligence Group believes that specific steps need to be taken in the application of smart tourism to make good the use of modern information technology for meeting tourists' demands for personal experience. Technological innovation is required to strengthen the operational competence of enterprise, to improve the management of innovation, and to promote a transformation of government. To balance the relationship between the public and private sectors, between scenic spots and tourists, both sectors need to transform the traditional simple ways of business adopted by the tourism industry to be more innovative in ways that are harmonious between the interests of the different stakeholders to develop win-win patterns of business (<http://wenku.baidu.com/view/0d0b74d328ea81c758f57893.html>, 2012).

The Tourism Bureau of Jiangsu Province believes that smart tourism is a new pattern of tourism development that is integrated, agile, digital and interactive (<http://www.jstour.gov.cn>, 2011) and meets tourists' demands and choices through the use of networking, cell phones and other portable mobile terminals and the Internet.

The Tourism Bureau of Zhenjiang Municipality shares a belief that smart tourism emerges from an integration of communication and information technology while placing the interactive experience of tourists at its center through the utilization of new technologies such as cloud computing. The Bureau visualizes an “Internet of things” to realize automated perceptions, timely transmission, an analysis and mining of various tourism information, an improved autonomy and interaction in tourism activities including food supply, accommodation, traveling shopping and entertainment – all to offer tourists more personalized experiences and ubiquitous tourism services that exceed their expectations. Another goal is to realize digital tourism management, intelligent tourism services and personalized tourism experience (Binhai New Area Development Group, 2013).

Sheng (2012) believes that smart tourism should consider technology development as an opportunity to realize the sustainable development of tourism industry through meeting tourists' demand for having personal experiences through innovation, improving enterprise operational competence by innovation management, and promoting the transformation of government function.

These definitions of smart tourism reflect an understanding of smart tourism in a practical work context. However, in the views of the authors, considering smart tourism as solely a new development model still fails to fully grasp the new connotations of smart tourism, and thus fails to consider the smart tourism as a new concept leading tourism towards future innovation and development. The lesson of this concept lies in describing a history of

tourism informative development, and making an effective connection between tourism informatization and the development of smart tourism.

The sixth type is the theory of tourist experience proposed by Yao (2012) and Fu & Zheng (2013). Yao Guozhang thinks that smart tourism is customer-centered, using intelligent technology, computers, mobile devices and intelligent terminals as the main form by which to perform intelligent service, intelligent business, intelligent management, and intelligent government affairs. The basic starting point of smart tourism is to fully satisfy the tourists' needs for food, accommodation, travel, shopping and entertainment. It is a new pattern of tourism operation (Yao, 2012) whose fundamental task is to create more value for tourists, travel agencies, scenic spots, hotels, government departments and other travel participants. Fu & Zheng (2013) believe that, based on cloud computing technology with smart phones and intelligent terminal equipment, smart tourism can realize the collection, mining analysis, real-time transmission and automatic induction of tourism information. As a result, it can improve tourists' initiative, autonomy, intelligence and interactivity. This can be achieved at every stage of tourist consumption, from information-gathering, travel decision-making, purchasing, destination selection and in the whole consumption process at the tourist destination. In so doing, smart tourism provides tourists with meticulous service and unprecedented experiences (Fu & Zheng, 2013). These concepts focus on the basic starting point and the footprint of smart tourism, giving priority to tourists' demands, and embodying the essence of smart tourism; however, they lack a systematic and comprehensive model. Equally there is no explanation offered of enterprise evolution, nor of the government's role and services in smart tourism.

The seventh type is a simple summary of smart tourism. Wang, Jin, & Zhou et al. (2012) classify the concept of smart tourism into three levels: for tourists, smart tourism is to simply provide access to tourism information and promptly arrange and adjust travel plans; for managers such as the government and tourism enterprises, smart tourism is about achieving a comprehensive and thorough system offering accuracy, convenience and the ubiquity of tourism information applications by building a tourism service platform, offering visitors catering, transportation, accommodation, traveling, shopping and so a full range of travel services and management efficiency; and finally, from a technical perspective, smart tourism is the achievement of a highly systematic and detailed interaction between physical tourism resources and tourism information resources, thereby serving the public, enterprises and the government with a new form of future tourism services (Wang, Jin, & Zhou et al., 2012). This approach amalgamates the previous concepts. Its advantage is to combine the application of tourist services and management, attach importance to tourist information, resource development and utilization, and also to demonstrate the effects of smart tourism from the perspective of technological application. The defect is that this concept cannot provide an accurate and clear evaluation of smart tourism. It is easy to understand but it is not a complete summary.

In general, the existing definitions of smart tourism adopted in China provide details as to key applications with respect to tourism development, but remain insufficient in terms of any generalization of its essential attributes. It is felt that in some ways the current definitions are overly specific, effectively reducing the concept to current conditions and thus risking it becoming out of date in the future due to changing circumstances. Nor do these definitions conform to the principles of concept formation. The fundamentals of smart tourism lie in tourism itself, especially in tourists. The new technology application is triggered by tourists' behaviors and the changes of tourist demand is the lifeblood of smart tourism. In the meantime, the latest technology also guides both demand and

behavior, making smart tourism a reality of today. All the other benefits that emanate from smart tourism simply arise due to the needs of tourists and their behavioral changes.

3. The foundation of smart tourism: an analysis

What is the foundation of smart tourism? The answer to this question needs to be considered from two perspectives: an international overview and the environment in China. Westerners are not so interested in the concept of smart tourism *per se* due to prior existing levels of social development and economic growth whereby market competition is the main driver of change, which includes the application of high-tech (including new mass medium) in their market behaviors besides other factors. At present, the Chinese authorities have heavily promoted the concept of smart tourism not as a consequence of tourism development but as a catalyst for change from a traditional service industry to a modern service industry through smart tourism and the pursuit of informationization in all business areas of tourism industry. Therefore, researchers need to examine the foundation of smart tourism and effectively combine their own expectations for smart tourism with China's actual development of tourism informationization, and help smart tourism become widely adapted to the on-going development of tourism industry in China to avoid a loss of vitality in the short term.

As noted above various scholars and businesses have contributed their own opinions as to sources and key features of smart tourism. Smart tourism can be interpreted as a novel operational mode integrated with technological development. The concept of smart tourism takes the independent personal experiences of tourists as its core and is based on an overall and integrated tourism industrial service. Its service objects include tourists, tourism service organizations and local governments in tourism destination (Fu & Zheng, 2013). Smart tourism provides varying forms of tourism information to all the entities within the tourism industry (Xu, Li, & Qian et al., 2013).

Smart tourism is the typical example of integrated development by combining tourism industry with technological innovations (Ma & Liu, 2011). It is a systemized, intensified and comprehensive system of tourism services (Xu, 2013). The essential connotation of smart tourism is the application of intelligence technology, including information communication technology applied in a tourism industry context (Li, Jia, & Wang et al., 2013), which serves as a comprehensive application platform to meet the personalized needs of tourists and realize the sharing of tourism resources and social resources so as to adapt to systemized economic, social, and technological changes (Liu, Tian, & Yan et al., 2013). Also, it serves as a comprehensive application platform to provide various public tourism services to tourism service enterprises and tourism administrative agencies (Jin, 2012). The whole process of tourism activities, and every link of tourism service chain have produced a *smart effect* and created the *value of smartness*, which has promoted the extensive power of development, innovation and service-offering to every business areas of tourism industry (Yao, 2012). Basically, smart tourism is characterized by its on-line services and meeting the user's needs of obtaining inclusive information about tourism services promptly and conveniently by collecting, transmitting and processing tourism information (Ma & Liu, 2011). It takes tourist-service as the core and places an emphasis on interacting with tourists. Its primary function is to meet the needs of tourists who are familiar with adopting mature technology. Additionally, it makes tourist consumer groups pay continuous attention to the application of new technology (Liu & Fan, 2011).

Smart tourism is centered on interactions between different tourists and is guaranteed by an integrated industry wide

information management system (Tang, 2012) that meets the needs of tourists to grasp and process tourism information from different sources with promptness and convenience and may be subject to terminations by service providers and users (Wu, 1962).

Wang, Jin, Zhou, and et al (2012) regarded smart tourism as an overall, transparent, precise, easy, prompt and an omnipresent application of tourism information. Baidupedia, provides an interpretation of smart tourism as the sense of intelligence of tourism information but notes that how to conveniently use the information has yet to be determined (<http://baike.baidu.com/view/5217093.htm>, 2012).

Both researchers and practitioners have attached importance to the role of tourism information in smart tourism. Without tourism information, there is no smart tourism. And if analyzed from another perspective, many new business types can emerge and grow from smart tourism (such as upscale tourism services), which has completely changed ways in which to organize and communicate tourism information and furthermore, has changed tourists' behavior.

Through smart tourism, tourists have ultimately acquired a cluster of valuable sets and sources of tourism information, whether the information collection is obtained by using APP or LBS software or by using other sensing equipment. In addition to that, they can get information from relevant Internet websites or in tourist consultancy service centers, and can even use virtual tour-experiencing systems. Such information will be of increasing value for tourists or tourism administrative agencies, no matter how it is provided or whatever type of information it conveys (words, pictures video materials, etc.) or what is the information source, or how is it processed and presented.

4. Definition and connotation of smart tourism

4.1. Definition of smart tourism

It can be concluded that smart tourism is the ubiquitous tour information service received by tourists during a touring process. Tour information service is the summation of the common attributes of smart tourism. However, not all of the information service falls into the scope of smart tourism. Only the ubiquitous tour information service, provided to individual tourists through initiatives based on the special requirements of those individuals, can be referred to as smart tourism.

The inherent logical nature of smart tourism is as follows: the first level is that smart tourism is a kind of tour information service that shows the fundamental attributes of smart tourism; the second level is that smart tour is an ubiquitous tour information service, which means smart tourism is not the usual tour information service, but the ubiquitous information available to tourists at anytime, anywhere and on the basis of any individual requirement. The third level is that smart tourism is the ubiquitous information service provided to the individual tourists rather than to tourism groups; and the fourth level is that smart tourism is a revolutionary tour information service, which is combined, cooperated with, optimized and improved upon during the tour activities in the form of ubiquitous processes, space and time, media, direction, terminals and organizations. It thus becomes possible to speak of ubi-processes, ubi-space and time, ubi-media, ubi-direction, ubi-terminals and ubi-organizations.

When providing a training course for smart tourism one of the authors, Professor Hu, conducted a questionnaire based survey among 116 university tourism teachers. The questionnaire consisted of three different definitions of smart tourism, those of Zhang Lingyun, Baidu Encyclopedia and concept discussed in this paper. It was found that the selections of which of the three alternatives was

best were very close, being 33%, 35% and 33% respectively. This nonetheless reinforces the notion that smart tourism is a form of information service.

4.2. Basic connotation of smart tourism

The tour information service involved in smart tourism changes the traditional group-targeted service provision that provides only non-custom-made, non-personalized information. Such information was offered by agencies through such methods as advertisements (television, internet, broadcast etc.) to provide tour information to potential tourists at the host destination, including weather forecasts and other information via phone SMS, and the local tour information service (via tour guide service, posters, brochures, signs, screens, enquiring terminals at tourist information centers) after the tourist arrived at the destination. All these forms of tour information were traditionally provided by different agencies, and remained isolated and scattered. The information tourists received was, therefore, also isolated and disordered, and often required giving prior notice. The methods of providing information were also unconnected.

The second core connotation of smart tourism is ubiquity, which means having or seeming to have the ability to be everywhere at once; of being omnipresent (Wirefree-wireless experts, 2012). Ubiquity means that the internet, accessible to everywhere, is integrated into people's life and provides various services everywhere. Calculation is not limited to the desktop anymore; users can enjoy computer capabilities and information resources without any obstacles through portable devices, wearable devices or other conventional and unconventional means (Chen, 2009). Individual tourists can now obtain tour information service at anytime, anywhere, via any kind of media, thereby forming an ubiquitous tour information service.

The third core component of smart tour is the individual tourist. In this definition, tour agencies provide tour information service to individual tourists, which agencies can then aggregate individual tourist' data for the whole touring process. Thousands of pieces of individual data comprise the "big data". Both management agencies and service agencies can now take advantage of relevant relationships in these "big data" to improve their services and business models so as to completely innovate tour operation models and achieve a seamless transition when upgrading the tour industry.

4.3. Basic extension of smart tourism

The ubiquitous tour information service therefore leads to a reconstruction of the tour information system, so optimizing the tour organization itself as well as fundamentally changing of tourists' patterns of information searching and behavior and changing tourism marketing, management and tour services. Hence:

① Smart tourism brings the changes to tourist

Smart tourism changes tourist information search behaviors. The tour information becomes flexible and various at the stage of collecting data. Tourists can obtain all kinds of touring information via internet websites based on previous tour behavior, clicking action on internet, spending records and other data sources. Tourists can also enjoy an experience of the tourist destinations by applying three-dimensional virtual reality software. In this way, they can get to know about different information about tour destinations, receive electronic coupons and make various reservation confirmations at intelligent terminals.

② Smart tourism bring significant changes in tourist's patterns of behavior

The flexibility of touring arrangements potentially available to tourists during their holiday has sharply increased, as does the random nature of their travel. Tourists will be less restricted by the pre-tour arrangements they may schedule before their departures; they can change the arrangement at any time or get to know about the latest destination information while on holiday. The methods of sharing any tour experience take various forms. For example, tourists can record their own travel route via photographs taken at the destination, or add travel notes on a social network platform, or link the photos with the positioning system used in Google Maps to share information with friends.

③ Smart tourism brings changes to the tour organizations

From the aspect of tourism marketing, touring information services can now trace demand and other marketing information. Smart tourism is an interactive bilateral flow of information between tourists and stakeholders in the chain of distribution through various media and dissemination channels, and different forms of information via text, pictures, videos and other products made by tourism enterprises. It achieves publicity and marketing of tourism products and destinations based on smart phone software development.

From the aspect of tourism management, smart tourism can provide valuable information services to tourists based on their requirements and locations, better supervise the quality of tour activities, and conduct statistical analysis on tourist groups to support the future promotion and marketing of tourist destinations.

Smart tourism also involves the touring information service offered by public service organizations and information service enterprises, such as tour Apps for smart phones with Apple and Android systems that can provide the location and navigation aid, electronic maps, reservation and other information services. At a hotel, tourists can check in and check out through FRID systems and use an mobile devices to know about the menu, room entertainment facilities, surrounding facilities, and so on. It is possible to display images of the scenic spots, three-dimension real scene (information) of tour attractions and the guidance from on line tourist guides during the tour are also available.

4.4. Comparing definitions: home and abroad

The notion of the smart tour proposed in this paper is based on the current practical situation of the tour information development in China. Tour information services and the exploitation and development of tour information resources are organically combined with the changes of tourists' behaviors brought by applying new technology. The present authors propose a new concept of smart tourism based on an ubiquitous information service. Compared with the existing model, the present model is more concise and comprehensible and makes it easier to grasp the attributes of smart tourism.

The definition of smart tourism *proposed* in this paper differs from not only overseas understanding, but also domestic explanations in such a large variety of theories as "Management Transform Theory", "New Tourism Form", "Technology Application Theory", "Practical Operation Theory" and "Tour Experience Theory". The notion of smart tourism put forward by the Tourism Industry Association of Canada as early as 2000 was limited by the technology of that time, and only proposed a concept based tour products and the tour business. The World Tour Organization

classified smart tourism into four levels. They are environmental cleanliness, being green, moral and promoting quality without emphasizing the great changes of tourism industry created by new tourist demands and the new technology. The definition of smart tourism provided by the World Tourism Organization is too broad and pays attention to technological application from the viewpoint of suppliers (tourism authorities). The smart tourism definition proposed by Molz (2012) understands smart tourism from the perspective of sociology, and states how mobile technology allows tourists to more fully participate in tour activities. Mobile technology applications are stressed, while other relevant technology application is neglected, such as application of the “Internet of things”, cloud calculation and ubiquitous technology that brings about changes to tourism industry and tourists.

Chinese definitions of smart tourism consider it as a new form of tourism that separates tourism information from smart tourism by emphasizing technology rather than tourism. It is relatively easy to unilaterally pursue advanced technology applications, but this results in neglecting the construction of the basic facilities and software environment on which smart tourism depends. Although the existing definitions are easier to understand in that they take smart tourism as a new technology application that brings about changes in management, services, marketing and other reforms, they intrinsically differ from the present proposal, which focuses on changing tour information services and applying the new technology from the perspective of the tourist, the core of the tourism industry. Although the existing definitions combine smart tourism theory with practice in a pragmatic way, and have high operability, they are outside of the range of the proposed definition (an extension of this former approach) and do not provide researchers with an intrinsic attribute of smart tourism. Nor does “Technology Application Theory” offer an accurate explanation about the attributes of smart tourism. It only emphasizes the different changes arising from the application of the new technology in the tourism industry. “Tour Experience Theory” puts stress on the result of the smart tourism, but is lacking exact understanding of the meaning of the smart tourism information service.

The definition of smart tourism constructed in this text differs from those at home and abroad. It is here perceived as a form of tour information service that under the application of a ubiquitous technology definitely centers itself on tourists (individuals). Its meaning is clear, accurate and its extension takes into consideration issues at the social, economic, management, service and other different levels mentioned in the definition of smart tourism at home and abroad. Additionally, the question “What is the smart tourism” has been answered accurately (Smart tourism is ubiquitous tour information service). It is easy to understand and implement.

5. Conclusion and discussion

Based on the above analysis of the domestic and international smart tourism concepts and exploration in the current circumstances of China's smart tourism development, this thesis constructs a concept of a smart tourism system with a ubiquitous tourism information service as its core. This system can basically cover all the different phenomena described by current domestic and international concepts, drawing on their advantages as the extension of this paper's concept and giving prominence to the core and substance of smart tourism, i.e. all the phenomena and relationships caused by the offering of information services to tourists. Also, this paper shares the same context as the development of tourism information systems and emphasizes the ubiquity of that tourism information service in the new era. Furthermore, even though the social and technological environments may change, the

core and result of the ubiquitous tourism information service will not change.

Understanding smart tourism in the light of tourism information services accelerates the development of smart tourism and helps organizations or institutes grasp its direction. By defining smart tourism as a tourism information service and making it the most crucial part of information flows, the concept of smart tourism proposed in this paper integrates tourism information flow with traditional and new forms of information dissemination, and highlights the role of accurate and personalized information designed to meet the demands of tourists in the era of fast growing wants for information and communication. Smart tourism will bring about a profound change in the tourism industry. Tourism “smartization” will be another significant breakthrough after tourism “informatization” and will become a new catalyst to support the development of tourism, confirming the trend that the tourism industry is becoming a modernized service industry.

The value of this paper is to correct the misunderstanding that smart tourism is only an application of techniques and in its return to the key concept of tourism informatization. It perceives smart tourism as solving various problems and difficulties facing tourism information services that seek to maximize the value of current tourism resources to achieve a qualitative change in the ways, channels and means of a tourism information service (ubiquitous supply). So, business operators can now overcome their disadvantaged position when compared with more advanced areas or countries by following the mainstream of tourism information services through exploring a developmental path of tourism smartization. Such a strategy is adaptable to various situations by taking local informatization or technological competence into account to better prepare further development of smart tourism in the future.

This paper takes smart tourism from being a simple and measurable layer of tourism information service to one that, by being centered on tourist needs, and applying the concept of ubiquity in China's tourism-information-services, will strengthen tourists' satisfaction in all forms of service communication, will improve the management at different levels of tourism administrative institutions, and increase enterprises' operational efficiency and decrease operating and marketing costs. That is, if a good tourism information service is offered to the tourist, all operators and consumers in various tourism businesses can benefit from the process. As a result, the prolonged barriers in the traditional way of tourism development will be removed and future development will become smoother. And eventually, the strategic target to transform the tourism industry into a modern service industry will be realized.

The value of this paper also lies in the aspect that the concept of smart tourism adapts to the broad environment of information consumption. As the core concept of smart tourism, tourism information services are an important premise for the consumption of tourism information, meaning that the provision of information takes the lead in tourists' information consumption, and the macro environmental improvement of information consumption greatly improves the service supply of tourism information. On August 8, 2013, the State Council issued “the Opinions on Promoting Information Consumption and Boosting Domestic Demand” which clearly states that “the government” will vigorously promote the emerging information services. Among all industries, tourism has the most abundant information service format, and it has formed various emerging E-commerce modes on the base of that format. Through supplying efficient tourism information service, smart tourism can develop more novel E-commerce modes and promote the consumption of tourism information.

In addition, this paper indicates a direction for the applications

of big data in tourism. The development of smart tourism relies heavily on big data, for smart tourism can develop “smartly” depending on the favorable resources supplied by big data (Luo, 2013). Smart tourism is a tourism information service for tourists. It forms massive instant data about the generation of tourist information and these data form a giant “data store-room” with tourist demographic data, tourism resources data, tourism management data and tourism marketing data. By using big data analysis and processing means, researchers can find more valuable connections and improved practice in tourism businesses and serve tourists better.

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