

# The Research on Demands and Development Strategy of Mobile Travel Service—an Empirical Study based on Chinese Scenic spot

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## Abstract

*As a combination of mobile e-commerce and traditional tourism, the mobile travel services have been being tested on part of the scenic areas of the country in recent years. It achieved worthy results and provided a lot of convenience for our visitors. With the investigation and method of PCA (principal component analysis), we concluded that demands of mobile travel service can be divided into five categories with demand degree from high to low: mobile information services, mobile marketing services, mobile payment services, mobile location-based services and mobile social contact services. Then, we used one-way ANOVA to explore the disparate impacts of s' attributes on the demands of the above services. Finally, on the basis of the findings, we proposed the industrial development strategies and marketing suggestions.*

**Key words:** *mobile travel, demands, PCA, one-way ANOVA*

## 1. Introduction

In recent years, with the development of the economy and the society, e-commerce has played an important role in service industry. 3G technique becomes mature and popular, creating a favorable condition for the development and popularity of mobile e-commerce. Mobile e-commerce combines with Wi-Fi technique with cellphones, PDA, PC as the terminals, breaking through the limitations of traditional e-commerce. Meanwhile, tourism as a highly integrated service industry featured by information-intensive and information-dependent is considered to be the best platform for developing mobile e-commerce.

Recently, mobile tourism E-commerce gets a rapid development in China. In May 1st, 2009, Mount Emei scenic spot first developed a mobile travel service ([wap.ems517.com](http://wap.ems517.com)) and first provide mobile WAP service in china, which shows the publicity of Mount Emei changed from mass media and desktop computer to mobile internet. In May 11th, 2010, travel E-commerce development seminar was hold in Hainan international travel island. E-commerce expert of MIIT showed his opinion in this seminar that the development of tourism industry was switching from growth mode to future mode, which included the new internet technology of 3G, 4G, the development of mobile E-commerce platform, access to the internet everywhere. In August 5th 2011, the integrated information platform of

Shangri-La mobile travel E-commerce project been officially launched by MIIT, which marked the new progress of tourism informatization in Yunnan province.

Nowadays, more and more mobile travel applications are appeared in front of consumers, such as “Donkey Attendants” “Play in journey” providing service to Mount Emei tourists. “Donkey attendant” started its service since December 30, 2011, which include tickets reservation, Scenic spot introduction, travel strategy in Mount Emei, sales promotion information, coupon and can be used under 3 kinds of system: iphone, android, sybiam. Compared with it, “Play in journey” can be accepted only by iphone and android system, but its advantages are GPS and verbal explanation. Besides these two strength, it also provides a opinion sharing platform, in which travelers will get valuable information from others.

Mobile travel application has become a part of our life, which provided all kinds of guide in our journey. Therefore, it is vital to understand consumer’s requirements by research method and provide guideline on making policy of industry development. This is an empirical study to find the factors of mobile tourism service demand. This research suggests the followings to develop other mobile travel services: Accelerate the development of related websites and client software and pay attention to initiative recommendation of information.

## **2. Literature Review**

### **2.1. Research on the Definition of Mobile Travel Service**

Foreign researches on travel information technology started from 1970s. But it wasn’t until early 1990s that the researches touched the point. Margaret Bruce (2002) reviewed the development of the main technologies in tourism industry and looked into the future [1]. Varshney (2003) did a general research on mobile e-commerce including an overview of mobile e-commerce and basic definitions [2]. Dimitrios Buhalisa and Rob Law (2008) studied the combination of the information technology and the tourism based on relevant literatures and predicted the future development of the imformalized tourism industry. This paper deems that the Internet has greatly influenced the industry structure of tourism, bringing huge opportunities and challenges to employees in this industry [3].

Home researches are still in the primary stage. There are different definitions given by scholars. Liu Yajun (2004) thinks that mobile travel e-commerce refers to e-commerce activities that are done through the combination of mobile terminals such as cellphones and PDA and the Internet. This includes information service, ticket-booking service, mobile location-based service, *etc.* [4]. Liu Siqing (2005) thinks that mobile travel e-commerce refers to that travel service consumers complete the trade with travel service providers by paying on mobile terminals through wifi or cable network [5]. Most scholars in China agree with this definition. Peng Xiaomin (2009) proposes that mobile travel e-commerce refers to e-commerce activities that are carried out by cellphones and notebook computers as the mobile communication tools are linked with the Internet [6]. Sun Yi (2010) summarizes domestic and foreign researches on mobile travel e-commerce and suggests for its future development [7].

### **2.2. Content of Mobile Travel Service**

Among foreign researches, scholars mainly focus on location-based service (LBS). Berger (2003) discusses four major functions of LBS. They are: 1) Location-based personnel, subjects, locations. 2) Routes that connect the above subjects. 3) Restaurant service, hotel service, store service and scenic spot service. 4) Search for periphery spots, such as traffic information [8]. Annika and Voisard (2003) focus on the importance of travel information

service on the basis of location-based service and discuss its future by taking Berlin as an example [9].

Jong-Woo Kim (2005) and some scholars study the combination of LBS and scenic guide service. He proposes a mobile guide system model based on LBS and thinks that it can be applied to scenic meteorology service, route service, emergency service, etc [10]. Shuchih Ernest Chang and some other also affirm the importance and the necessity of LBS in today's travel service. They take Taiwan s as samples and do empirical researches on the relationship between s' attitude and the demand of LBS. The results show that perception of usefulness; safety and privacy are directly concerned with s. More attention should be paid to safety and privacy of LBS [11].

With the development of mobile e-commerce, cellphones have been an integrated part of people's life. Featured by swiftness and convenience, cellphones are a good companion of the fast and customized service of the tourism industry. Some scholars begin to study the specific applications of cellphones on mobile travel e-commerce. Michael Kenteris and some others (2009) discuss the use of cellphones as tour guides and try to establish a set of detailed evaluation standard to be abided by for designers and developers [12]. Angel García Crespo (2009) is aware of the importance of real-time information of travelling and focuses on SPETA system that helps tourists get customized service with convenience [13].

Juhana Salim (2010) establishes a MTD system based on widely application of mobile equipment such as cellphones and PDA that helps tourists search for travel information and facilitates communications through mobile equipment [14]. Berger (2003) thinks that smart phones, PDA and similar mobile equipment enable travelers to search for information beyond the limitation of time and space. The information include hotel, ticket-booking, car renting, and destination guide and so on [8].

Alfaro (2005) constructs a multi-media handbook on travel destinations based on PDA and infrared rays. When travellers use PDA to accept infrared rays, related scenic information will present itself [15]. Harry Bouwman and Christer Carlsson (2007) study the advantages and obstacles of cellphones by taking Finland which is good at mobile communication as an example, and test 6 cellphone service models and their differences [16]. Hui-Huang Hsu (2011) proposes a cellphone service model based on mobile communication technology that applies to tour guide in the museums [17].

Among domestic researches, Liu Yajun (2004) generalizes the concept of mobile e-commerce and its functions and names three applications in tourism industry, that is, tourism ticket-booking service, information service, and location-based service (LBS). The author thinks that mobile e-commerce will greatly contribute to domestic tourism industry and thus proposes policies for its future development [4]. Qin Baoli (2010) also discusses emerging business technologies such as mobile payment service, mobile Internet service, mobile customer relation-management service, and integrated business service [18].

Qiao Wei (2006) summarizes the development of travel information service of cellphones in developed countries such as Japan, Europe and US and categories the content of the service by its information source, namely, tourist organizers, mobile operators and information service providers [19]. Xia Zhongchao and Luan Xiaona (2008) study the application of mobile e-commerce in tourism industry and divide the service into travel information service (via messages), travel reservation service (such as ticket booking and hotel booking), map service, travel voice service (such as "cellphone guide"), and travel recreation service [20].

Xing Cunyu (2010) thinks that China will enter a new era of 3G and portable PDA will be widely used when travelling so that round-the-clock service will be available in scenic areas [21]. Wang Zhaocheng (2011) adopts SWOT method to analyze mobile travel e-commerce

and thinks that its glaring advantages will bring new chances to the development of tourism industry [22].

Cao Wu and Guo Lingbing (2004) suggest that cellphones are important to the development of mobile travel e-commerce and points out that the combination of short messages and the information management system of travel agencies will set up an all-new platform for the communication between travel agencies and tourists and facilitating the membership management, travel management and advertising service, *etc.* [23]. Li Ping (2008) constructs a new model for the travel message service system with the cellphone as an important tool to obtain travel information [24]. Lv Xinyang and Yin Min (2009) also analyze the current situations and features of cellphone network marketing and propose targeted policies for addressing existing problems [25]. Wu Jiangshou and some others (2010) discovers new models of the mix of cellphone and mobile service in scenic areas based on high popularity of the cellphone from the perspective of customized demand, resources in scenic areas, service providers to promote a new informationalized way that achieves win-win results [26].

### **2.3. Case Study of Mobile Travel Service**

Among foreign researches, Jinn-Shing Cheng and some others (2010) study mobile travel map and guide service and establish a wireless application platform taking the example of Android cellphone. This platform gathers GPS, multi-media, Google map and other functions and takes into consideration local characteristics and cultures. Researchers believe that such platform will largely promote the development of tourism [27]. Christer Carlsson and Pirkko Walden (2008) think that people pay more and more attention on information sharing and interaction. They establish a “MOGO” cellphone mobile application taking Finland and Aland Island as examples to meet tourists’ demand on information and improve the quality of service [28]. Chien-Chih Yu (2008) points out that customized social service will facilitate the development of travel e-commerce and thus sets up an integrated service framework that links customized service with community service which will help tourists plan routes, search information, complete payment, follow up the travel and verifies the accessibility and efficacy of this framework [29].

Among domestic researches, Ma Yong (2003) takes the initiative to combine e-commerce and the scenic areas in his research. He studied the mode and method to construct e-commerce model at the tourism destination and explained it by Sanxia scenic area [30]. In 2007, his research extended to emerging mobile e-commerce and discussed its current situation of development and based his theory on real situation. Focusing on B2C, he constructed a systematic application model of mobile e-commerce at the tourism destination while taking into consideration the factor of information treatment system with Sanxia scenic area as the example [31]. Hou Zhiqiang (2009) focuses on specific mobile guide service and proposes an area tour guide platform while analyzing the operation result of Ningde, Fujian, bringing new ideas to scenic service [32]. Liu Jin (2010) constructs a targeted mobile e-commerce platform, designs and analyzes the platform in accordance with tourists’ demand with parks in Beijing as research subjects [33].

### **2.4. Research on Users’ Demand of Mobile Travel Service**

Foreign researches are more or less based on Technology Acceptance Model (TAM) proposed by Davis in 1989. This model includes perception of usefulness and perception of easiness. Ghandour and Buhalis (2003) find out that accommodation condition and traffic condition are concerned with most tourists. This paper lists factors that influence tourists’

acceptance of mobile service information and the rank of importance with demand degree from high to low are: usefulness of the information, price, service quality, safety and health problems [34]. Niklas Eriksson and Peter Strandvik (2009) study factors that influence tourists' use of mobile travel service based on TAM model [35].

Based on NIM project launched in Finland and Aland Island, the author studies three mobile applications in NIM project: MobiPortal, TraveLog and MobiTour with the residents on the island as research subjects and reaches the conclusion that price is the most important factors, and perception of risk and convenience are also concerned factors. Shintaro Okazaki and Morikazu Hirose (2009) study the attitude of consumers of two genders in Japan towards mobile Internet service. Based on the gender theory and the model of degree of satisfaction, attitude and usage habit, the researcher concludes that female have a stronger demand of mobile travel e-commerce service than their male counterparts. Besides that, people who have been accustomed to traditional media and PC Internet respond to it with lower willingness [36].

Among domestic researches, Peng Runhua (2009) conducts empirical researches in Guilin area based on TAM model and finds out that mobile travel e-commerce service is influenced by self-perception, perception of risk and other factors. The author illustrates evaluation standards of service quality of mobile travel e-commerce and suggests ways for improving the service [37]. Xia Zhongchao (2009) researches on college students' attitude towards mobile travel service and further proves the efficacy of TAM model. He points out that the attitude strongly influences the behaviors of users. And the biggest factor is the perception of efficacy of mobile travel e-commerce [20]. Shi Zhi (2009) constructs a user accept behavior model and proves its efficacy. He also researches the relationship between the tourists' acceptance and usage [38]. Miao Xin (2011) also constructs tourists' acceptance behavior model base on TAM model and takes the college tourist as samples. The results show that perception of usefulness, tourist experience, tourists' satisfactory and other factors that influence tourists' acceptance, suggesting that mobile travel service should pay attention to tourists' degree of satisfactory and loyalty [39].

Generally speaking, researches on mobile travel service both home and abroad, are single and more focus on concept description, policy-making, analysis on application prospect, etc. Domestic researches are on the primary stage with single content. Scholars either take TAM model or AUTAU model to find out how much people accept mobile travel e-commerce but lack researches that address tourists' demand. This paper aims at probing into the current demand of mobile travel service in our country through questionnaires and data analysis and provides targeted and possible suggestions for all parties.

### **3. Research Design**

#### **3.1. Research Subjects and Method**

The subjects of this research are tourists and potential tourists. In October 2012, researchers gave out random questionnaires in E'mei Mountain and Jiuzhaigou in Sichuan Province. 90 questionnaires were given out in each scenic spot and 176 or 97.78% were collected. Deleting 22 questionnaires that wasn't filled carefully and missed at least three items, 154 were effective, taking up 87.5%. The researchers also did surveys on potential customers and gave out 60 questionnaires in the largest walking street Chun Xi Road in Chengdu. 50 or 83.33% questionnaires were effective. There are all-together 204 samples for statistical analysis by SPSS 19.0, a professional statistical software.

### **3.2. Content of the Questionnaire and the Variables**

The questionnaire is divided into three parts. The first part consists of 8 questions, looking for basic information of tourists' use of mobile travel service. The second part is a scale with 22 questions, for surveying the degree of demand of mobile travel service. The third part consists of 6 questions, for the basic information of subjects.

## **4. Data Analysis and Conclusion**

### **4.1. Basic Information of Samples**

In the research, there are 204 effective questionnaires for statistical analysis. 120 are male, taking up 58.8%. 84 are female, taking up 41.2%. For age distribution, 18 or 8.82% are under 18 years old. 126 or 61.76% are between 18 to 35 years old. 48 or 23.54% are between 36 to 55 years old. 12 or 5.88% are above 56 years old. For education distribution, 62 or 30.39% receive no higher than junior middle school education. 50 or 24.51% receive senior middle school education. 92 or 45.1% have college education. For vocation distribution, 72 or 35.3% are students. 66 or 32.35% are employees of enterprises. 24 or 11.76% are staff in state-owned enterprises or institutions. 12 or 8.83% are civil servant. 24 or 11.76% take up other professionals.

### **4.2. Analysis on Major Factors of Mobile Travel Service**

This research employs Likert scales (scale V) consisting of 22 mobile travel service items to see tourists' demand of different mobile travel services. By applying 22 variables to factor analysis, this research finds out some basic but unobserved hidden factors.

During the factor analysis, this research first applies the 22 variables to KMO and Bartlett sphere detection. If they pass the detection, it indicates that variables are correlated and suitable for factor analysis. KMO is used to compare simple correlation and partial correlation among variables. The KMO value is  $0.808 > 0.8$ , which means that they are qualified to do factor analysis. Bartlett sphere detection is used to test the significance of correlation coefficient among variables. The Bartlett value is  $0.000 < 0.05$ , which means that they are qualified to do factor analysis.

This research adopts principal component analysis and does factor rotation by orthogonal method to find out 5 factors whose characteristics value is more than 1. Delete 3 variables whose factor load capacity is lower than 0.5 and those who cross two perspectives with the load capacity higher than 0.5. Repeat the factor analysis. The characteristic roots of retained 5 factors from 19 variables account for 70.831% of total variance, with the load capacity of each factor higher than 0.6 (Refer to Table 1). Name five factors, they are, mobile information service demand, mobile marketing service demand, mobile payment service demand, mobile location-based service demand and mobile social contact service demand.

**Table1. Results of PCA for the Demands of Mobile Travel Services**

Factor items	Variables	Factor load capacity	The cumulative total variance explained (%)
Mobile information service demand	Cellphone map	0.736	21.878
	Search for information of scenic spot	0.821	
	Search for information of travel route(scenic spot or its periphery)	0.870	
	Search for recreational information of peripheries of scenic spots(cinema, restaurant, shopping)	0.783	
	Search for promotion information (scenic spot or its periphery)	0.689	
		0.723	
Mobile marketing service demand	Mobile marketing service based on one's interest(eg: I like animals, service providers may provide me with information of animals in the scenic spot)	0.632	31.704
	Mobile marketing service based on one's location(eg: service providers may provide me with information of snacks or restaurants in the scenic spot or its peripheries.)	0.705	
	Mobile marketing service based on one's activities(eg: when driving, service providers may provide me with information of parking)	0.795	
	Mobile marketing service based on one's visiting time(eg: when access to the website at noon, service providers may provide me with information of restaurants or promotion)	0.783	
	Mobile marketing service based on one's environment(eg: when raining, service providers may provide me with information of taxis)	0.792	
Mobile payment service demand	E-ticket	0.606	50.064
	Ticket booking via cellphone	0.755	
	Payment of flight ticket and hotel via cellphone	0.788	
Mobile location-based service demand	Voice or 3G video self-service tour guide	0.723	61.899
	GPS	0.744	
	Mobile medical or safety assistance service in the scenic spot	0.649	
Mobile social contact service demand.	Real-time photo sharing when travelling	0.906	70.831
	Mobile blog (with friends/companions during the travel)	0.812	

### **4.3. Status Quo and Demand of Mobile Travel Service**

**4.3.1. Status Quo of Mobile Travel Service:** By descriptive statistics, the status quo and the demand of mobile travel service in the questionnaires are analyzed with the following results: In the question of “what types of mobile travel service have you used”, top 5 answers are: cellphone map (utilization ratio is 58.5%), search for information of travel route(scenic spot or its periphery)(49%), search for recreational information of peripheries of scenic spots(cinema, restaurant, shopping)(44.1%), search for promotion information(scenic spot or its periphery)(42.2%) and search for recreational information of the weather (35.3%). It is clear that current applications of mobile travel service concentrate on information of the scenic spot or its peripheries.

In questions of “what types of mobile travel service do you want to experience”, top 5 answers are: 3G video tour guide (rate of hoping to experience is 32.4%), wifi service in the scenic spot (30.4%), voice self-service tour guide (26.5%), e-coupon (23.5%) and e-ticket (20.6%). It is obvious that mobile travel services that tourists want to experience are self-service tour guide and mobile payment for flexibility and convenience.

In the choice of obtaining way of mobile travel service, 33.3% tourists prefer “visiting the website via cellphone”, 35.3% prefer “installing an app on the cellphone”, 5.9% prefer to send message for information and 5.9% prefer making phone calls for information, the rest 19.6% prefer recommendations of app from service providers. The survey results are complied with the real situation. More than 2/3 prefer visiting the website and customer terminals for information. We also notice that the initiative marketing by service providers is welcomed and is supposed to be a new breakthrough in developing mobile travel service.

**4.3.2. Demand of Mobile Travel Service:** In the demand analysis on five mobile travel services concluded from factor analysis, we can see a high demand in mobile information service with the average value of 4.163. The next is mobile payment service with 4.016; mobile marketing service with 3.868, mobile location-based service with 3.706. The lowest demand is mobile social contact service, with 3.559.

Then we employ single sample T detection to 5 mobile travel services and find out significant differences between the demand of 5 services and the detection value 3 (which corresponds to “doesn’t matter” in the 5 scales). This indicates that 5 services are more or less needed. Besides, there are significant differences between the demand of “mobile information service” and the detection value 4 (which corresponds to “need” in the 5 scales), further suggesting that “mobile information service” is highly demanded to the extent of “need it very much”.

### **4.4. Factors that Influence the Demand of Mobile Travel Service**

This research adopts single sample T detection, variance analysis with single factor and tests the influence of variables on the demand of mobile travel service. These variables include gender, way of travel, age, education, vocation, times of travel every year, type of cellphone and frequency of access to the Internet via cellphone. We also do a after analysis by LSD and Tamhane’s T2 for factors with more than 3 items and find out the specific differences (Refer to Table 2).



**Table 2. The Disparate Impact of Tourists' Attributes on the Demands of the Mobile Travel Services**

Influence factors	Mobile information service demand	Mobile marketing service demand	Mobile payment service demand	Mobile location-based service demand	Mobile social contact service demand
Gender	Female > male	—	—	—	Female > male
Way of travel	Self service > package tour	Self service > package tour	—	—	—
Age	18-35 years old > above 56 years old	—	18-35 years old > above 56 years old 36-55 years old > above 56 years old	—	—
Education	—	—	College education > junior middle school education Senior middle school education > junior middle school education	—	—
Income	—	—	—	—	—
Vocation	Students > employees of enterprises	—	—	—	Students > employees of enterprises Students > staff in state-owned enterprises or institutions Students > civil servants Students > others
Times of travel every year	More than 7 times > 0-2 times	—	—	More than 7 times > 0-2 times 5-6 times > 0-2 times	—

Type of cellphone	3G cellphones> non-3G cellphones	—	3G cellphones> non-3G cellphones	3G cellphones> non-3G cellphones	3G cellphones> non-3G cellphones
Frequency of access to the Internet via cellphone	Often>occasionally Often > never	—	Often >never Occasionally > never	Often > never	Often > never

Note: “\_” means there is no obvious difference.

## 5. Policy for Future Development

### 5.1. Segment Five Services and Marketing with Targets

Research results show that mobile travel services can be divided into five types with the demand degree from high to low: mobile information services, mobile marketing services, mobile payment services, mobile location-based services and mobile social contact services. Since scenic spots have more direct contact with tourists, there should be more surveys to learn about the dynamic change of tourists’ demand. By segmenting the services, we can make targeted policies to address tourists’ demand. For example, the mobile information service can be segmented to: searching for information of scenic spots, searching for information of peripheries of scenic spots, e-payment information in scenic spots, weather information to make the service more integrated.

In addition, this research suggests the followings to develop other mobile travel services:

Accelerate the development of related websites and client software and pay attention to initiative recommendation of information.

Based on analysis result of factors that influence mobile travel service, be aware of targeted group or high quality client, namely, female tourists, self-service tourists, tourists between 18-35 years old, tourists with at least senior high school education, students, tourists that travel more than 5 times a year and tourists who have 3G cellphones.

### 5.2. Strength Cooperation of the Industry-chain and Promote Common Development

Tourism is an integrated service industry, covering “eating, living, transport, visiting, shopping and recreation”. The penetration of e-commerce to tourism prolongs the industry chain, in which mobile operators are playing an important role. Currently, China Mobile, China Unicom, and China Telecommunication draw from their own advantages in technology, capital and customer base. If they can win support from financial institutions, software and Internet platform provides, they can actively promote the mobile payment service and bring e-commerce to a higher stage of development.

Moreover, service providers in scenic spots should cooperate more with travel service providers (such as travel service websites and agencies). Travel service providers as the core of the industry chain can better integrate multiple tourism resources. Thus, service providers and mobile operators can drive the industry chain through “service content” and “technology” to popularize mobile travel service.

### 5.3. Perfect Laws and Regulations and Enhance Government's Role

Mobile payment is an integrated part of mobile travel service. The payment development mode needs further exploring and to some extent it is impeded by lack of government guidance. Under such condition, the government should take an active attitude in guiding the mobile payment and standardize behaviors of all parities by laws and regulations.

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