

Research on the construction and application of tourism marketing platform based on mobile internet—taking wechat as an example

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Abstract. With the progress of science and technology, the development and improvement of internet technology, smart phones are gradually popular in our daily life; our world has achieved a swift transition to the mobile internet era from the traditional internet era. Various tourist areas have established “Digital Scenic Spots” in recent years, making internet combined tightly with tourism. The construction of scenic-spot marketing platform based on internet is an important component of constructing “digital scenic spot”. In this paper, tourism marketing platform on mobile internet is established by analyzing mobile internet mainstream technology and its application in tourism marketing. In this thesis, the architecture of marketing system uses MVC pattern with a three-tier distributed structure and logic layer of the system uses the construction of JavaBean and EJB. The paper also builds wechat marketing model based on MM-TIP. The result of research provides some reference for constructing tourism marketing platform based on mobile internet.

Key words. Internet, tourism marketing, Wechat platform, MM-TIP.

1. Introduction

The appearance of the mobile phone has gradually pushed us into mobile internet era from the traditional internet era. Desktop computer and notebook is the main tools online in traditional internet era, while mobile phone is major in mobile internet era^[1]. The application of “mobile QQ” first came into the public eye back into on July 21th, 2000. In 2010, Xiaomi smartphone launched social software—“MiChat” – for its users and registered users of “MiChat” reached over 6 million within a year. In order to grapple with the threat to QQ from “MiChat”, Tencent then launched “Wechat” software. The users of Wechat surpassed “MiChat” in the very short term on the strength of a large user base of Tencent. According to statistics, it is discovered that users of Wechat has reached chmetcncvUnitNamemSource-

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Value600HasSpaceFalseNegativeFalseNumberType1TCSC0600m at all globally until the end of 2013. Therefore, it has great marketing value in the background.

The global tourism industry has become increasingly competitive in 21st Century, which is mainly reflected in the competition among tourism marketing strategies. Different tourism spots tend to homogenization in products and alternatives is more obvious among these tourism spots. That leads directly to a result: only good marketing strategy can bring to greater benefits^[2]. Stanley Plog said that few tourism spots could wait for a windfall in faced with a more and more fiercer marketing competition. Marketing is an extremely important power for management; and good marketing strategy can expand the scale of the tourism market ^[3].

Wechat, a new social platform based on mobile internet technology, provides an intelligent lifestyle for people. According to statistics, users of Wechat have broken the barrier of 500m by the end of 2014, which shows capability of the APP to expanding rapidly. Also, for tourism, the main attraction of the app is its prominent mobile qualities. The main purpose of tourism industry is to attract people's attention so that a good marketing strategy is a breakthrough for the development of tourism and potential customers is regarded as key objects observed by tourism managers. Wechat marketing, as a new innovative marketing model^[4], builds friendship for users across space and time. With wider range of application of Wechat, Tencent developed commercial application of Wechat- Wechat payment - for adjusting to the new trend. The launch of Wechat payment is a major step and then Wechat begins to be widely used in all respects of daily life.

2. Research on Application of Mobile Internet Technology

2.1. Mobile Internet Mainstream Technology and Its Application

There are a variety of mainstream technologies of mobile Internet, including mobile information inquiry and information customizing, search and location, online mapping, mobile phone payments and so on^[5]. These technologies are being widely used. Some popular applications will be analyzed in this paper.

(1) Mobile search

Mobile search is to create opportunity for mobile phone sales, so comfortable user experience is always regarded as the goal which related corporation struggles for achieving sales target. Application of mobile search had remarkable influence for technology innovation and industry revenues. Its users keep loyalty to some mobile search with a certain degree rather than selecting one or two mobile search operators.

(2) Mobile payments

The purpose of mobile payment usually has two: one is very easy to finish payment; as an important reason, the other is to improve security^[6]. Market has an extensive need for mobile payments. Due to its varied tech options and business models, mobile payments will be a highly diversified payment platform.

(3) Location-based Services

Location-based Services (LBS), a widely used application by mobile users, is used

to quickly find your destination and location^[7].

(4) Mobile browsing

Mobile browsing is widely used in business field. At present, different webpages and news browser and client app, like Tencent news, have also been widely used in domestic smartphone apps.

2.2. Application of Mobile Internet Technology on Tourism

Internet has been applied to tourism since its appearance. Tourists can search for the information of scenic spot and reserve hotels online and other service. Mobile internet is now being widely used in daily life. Based on the common mobility, mobile internet will suit the working of tourism, where all directions are compromises. By smartphone terminal, mobile internet technology was applied on tourism services involving in the following aspects:

(1) Mobile information service: providing information inquiry and information customizing

There is much uncertainty in the journey and tourists need to know the information of scenic spots and its route anywhere and anytime^[8].the advent of mobile internet solve this matter. It is convenient that tourists can know all information they need by a smartphone.

(2)Location-based Services: providing location and maps

Strange environment causes great inconvenience in the process of travelling. Therefore, tourists can enjoy location-based services and navigation services by smartphone. Mobile users can get service what they needed by online map. Those map apps can provide location service, search for routes, and query traffic status of scenic areas, neighboring restaurants and hotels and so on. In addition, when you are in danger, you can provide accurate location information for the Rescue Service in order to gain time.

(3) Virtual tour guide service

Virtual tour guide service provides much information like written texts, voice commentary and image information for tourists by mobile internet even when no tour guide accompanies. This service produces the realistic virtual environment, making travelling more wonderful and colorful.

(4) Social applications like Weibo

The rise of Wechat and Weibo has had a very important influence on people's travel habits. Many tourists like to share photos and happiness from travelling by Wechat and Weibo. As the same times, tourists can also make comments on scenic spots or review previous comments and pictures by apps.

(5)Payment Application of mobile phone

While tourists using mobile phones to make payments, they can avoid embarrassing episode of no cash and the security of their properties can be provided.

2.3. Marketing on Location-based Services and Digital Map Services of Mobile Internet

Mobile location services, a technology or service used to mark the users' location in the electronic map, can obtain users' geographical position information (longitude and latitude coordinate) by specific locating technology. Mobile location technology includes 2 realization methods: one is satellite positioning (GPS-dominated), the other is base station positioning. Satellite positioning is realized by satellite positioning system and needs to corresponding embedded Multi-chip modules in users' terminal. Satellite positioning mainly includes GPS of USA, European Galilean System, and GLONASS of Russia and China's BeiDou navigation satellite system. Base station positioning obtains the location of mobile by computing distances from the operator's base to mobile phone. Base station positioning can be achieved by mobile phones with no the function of satellite positioning but the accuracy of positioning depends on distribution and coverage of the base stations. In addition, positioning mode in small-range areas can also achieved by WIFI. The application of mobile location technology has found an increasingly wide utilization. Special mobile location system can achieve location towards personnel, events and objects to meet the requirements of positioning in some industries like mobile office, mobile law enforcement, and transport, logistics, tourism, and land and resource survey and so on.

Digital maps are the existence of paper maps with forms of digitization expression. It refers to discrete data representing ground elements (or ground phenomena) with fixed coordinate and attribute in given coordinate system. It refers to an order assemblage outlined by computer-sensible storage medium. Based on maps database, digital maps is stored in external memory in digital form to show maps on electronic screens.

For tourists, mobile positioning and navigation technology and digital maps service is necessary. For tourism management department and tourism industries, providing mobile positioning and navigation technology and digital maps service is an important way of stepping up tourism marketing services and it provides a platform for tourism marketing propaganda.

2.4. Analysis of Tourists Flow Volume Based on Social Networks

Mobile internet is the core trend of media development in the future. According to datum, In the future, China mobile internet market will be composed of five main bodies: mobile operators, internet companies, mobile terminal providers, mobile business companies and traditional medial. With the features different from the ones of traditional media, mobile media with entertainment functions can quickly and cleanly get information as well. It will become the main direction of media development. Mobile media occupy the market space of traditional media to a large degree and more and more people choose mobile terminals to search for information and entertainment.

According to statistics, mobile phone users have accumulated a huge group in

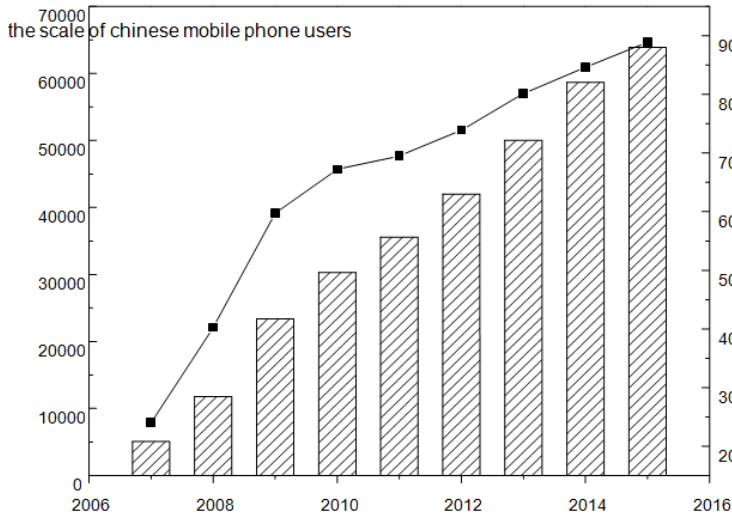


Fig. 1. the number of china mobile netizens & mobile netizens accounts for the proportion of total netizen

China and the proportion of phone users are increasing distinctly in netizens. Traditional internet and mobile internet trend has been represented in *Report on internet trend in 2015*. The author thinks that mobile ads has an enormous developing space because mobile phone users have a thumping majority compared with the proportion of mobile users in total netizens and desktop internet has been replaced by mobile internet. Therefore, the author also considers that the internet structure will be changed with the appearance of mobile internet. Nowadays, tourism marketing needs the support of medium and mobile internet opens up a new way for us.

By Social Network Analysis to study tourism, research effort has focused on the following aspects:

(1) Network Size of Tourism Flow

Network size of tourism is represented by the number of tourism network nodes. All possible quantity relationship can be expressed by formula (1) in directed graph of the network (“k” refers to the number of tourism nodes).

$$k \times (k - 1) \tag{1}$$

Possible quantity relationship can be expressed by formula (2) in no-directed graph of the network (“k” refers to the number of tourism nodes).

$$[k * (k - 1)] / 2 \tag{2}$$

(2) Density of Tourism Network

The numerical value of density of tourism network reflects how closely all network nodes of tourism are and the formula of network density of tourism can be expressed by (3, 4).

$$D = (2 \sum_{i=1}^k d_i(n_i) / (k * (k - 1))) \tag{3}$$

$$d_i(n_i) = \sum_{j=1}^k d_i(n_i, n_j) \tag{4}$$

According to the formula, “k” refers to the number of nodes, “D” refers to the numerical value of tourism network density, namely an index from 0 to 1 (“0” refers to no connection and “1” is closely related). For example, when “k=3”, “D=0.7”, it shows that nodes are closely related.

(3) Centrality of Tourism Network

Centrality, an important element of analyzing social network, shows which core position actors is in by quantitative methods. Also, it can reflect the influence of centers node on other tourism nodes.

Table 1. Analysis Table of Centrality

	Point centrality	Intermediate Center	Close centrality
Absolute point centrality	$C_{ADi} = \text{thedegreesofi}$	$C_{ABi} = \sum_j^n \sum_k^n b_{jk}(i)$ $j \neq k \neq i(j < k)$	$C_{APi}^{-1} = \sum_{j=1}^n d_{ij}$
Standardization Center		$C_{RBi} = \frac{2C_{ABi}}{(n^2 - 3n + 2)}$	$C_{RPi}^{-1} = \frac{C_{APi}^{-1}}{(n-1)}$
Central potential of a graph	$\frac{C_{RD}}{\sum_{i=1}^n (C_{RDmax} - C_{RD i})} =$	$\frac{C_B}{\sum_{i=1}^n (C_{Bmax} - C_{RBi})} =$	$\frac{C_c}{\sum_{i=1}^n (C_{RCmax} - C_{RC i})} =$
	$\frac{1}{(n-2)}$	$\frac{1}{(n-1)}$	$\frac{1}{(n-2)(n-1)}$

“ d_{ij} ” represents the shortest path from “i” to “j”.

For example, when “n=5, $C_{RD}=9$, $C_B=7$, $C_C =10$ ”, it shows that the larger numerical value, the stronger influence on other nodes in tourism network.

In terms of set theory, marketing system can be regarded as a collection of some objects. It can be expressed in “O”, namely

$$O = \{o_1, o_2, \dots, o_n\} \subseteq U \tag{5}$$

in the collection, “ $o_i \in U$ ” is called the object and “U” called discourse domain of the object.

All objects can be expressed in a finite set “M” with attributes, namely

$$M = \{m_1, m_2, \dots, m_n\} \tag{6}$$

The define domain of every attribute m of set M is Z_m , which means that every

attribute has a corresponding value. Defined function is as follows.

$$\rho O \times M \rightarrow Z \tag{7}$$

$$V = \bigcup_{m \in M} V_m \tag{8}$$

The system can be expressed by the following set as described above

$$S = \langle O, M, V, \rho \rangle \tag{9}$$

In the marketing information system $S = \langle O, M, V, \rho \rangle$, set m can be regarded as the combination of subset C and subset D , namely, $A = C \cup D$ and $C \cap D = \Phi$. Therefore it can be translated into the expression of decision: $S = \langle O, C \cup D, V, \rho \rangle$ (“ C ” refers to the condition attribute and “ D ” refers to decision attribute)

$$C = \{ c_1, c_2, c_3, c_4, c_5 \} \quad D = \{ 01 \} \tag{10}$$

“0” refers to agreements and “1” refers to disagreements

Table 2. Different Condition Attributes Have Influences upon Decision Attributes

The value of O	The value of C	The value of D
1	0.4	1
2	0.5	0
3	0.6	0
4	0.6	1
5	0.7	1

With the increasing proportion of China’s mobile phone netizen and increasing the tourism flow, the connection between scenic spots is closer and closer and tourism marketing based on mobile internet is feasible.

3. Research on the construction and application of tourism marketing platform based on mobile Internet— Taking WeChat as an example

3.1. Overall Framework of Wechat Marketing Platform of Tourism Based on Mobile Internet

In internet marketing platform on constructing scenic areas, the core is to organize data effectively, show the features of the scenic areas and improve its services and management. Intensifying marketing functions of tourism is an effective breach to operate the marketing platform. Therefore, the platform needs to provide required functions for tourists such as the traveling information collecting, processing, publishing and updating, including products information as well. The framework of internet marketing platform on scenic areas is as the Figure 2 shows:

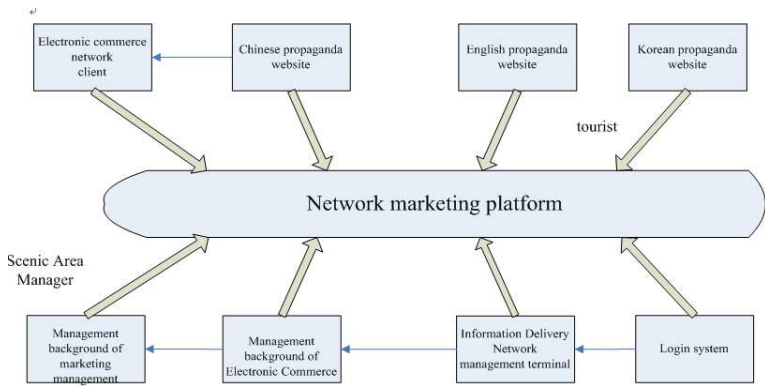


Fig. 2. The Framework of Internet Marketing Platform on Scenic Areas

Network marketing platform on scenic areas can be regarded as the collection of web sites with different functions. For tourists, the platform is composed of propaganda and displaying website with different languages and e-commerce network client. For scenic areas managers, the platform is composed of login system, management system and background of marketing management

A clear software architecture level of development and design has become a priority for developer. Some architectural patterns are developed based on MIS system of JZEE such as Struts; Turbine and RealMethods. Those modules have been widely used due to clear ideals and simple architecture. Development and design of system is carried out based on architecture, which play an important role for ensuring the stability and quality of system. The marketing platform is constructed based on the MVC and Struts in this paper. As the Figure 3 shows, its organizational structures are further refined.

In this paper, the system adopts the architecture plan of MVC. With three-tier distributed structures, it uses JavaBean and EJB to construct the logical layers of system. The model is as Figure 4 shows.

3.2. Constructing MM-TIP Model on Tourism Marketing based on Mobile Internet

There has been a great deal of achievements on Marketing in the modern period. As a part of marketing, the purpose of tourism marketing is to promote tourism images and sell tourism products. Tourism marketing takes medium as the carrier of tourism products and takes promotions, distributions and relationship marketing as marketing strategy. Adopting tourism marketing strategy needs to obtain specific marketing methods by comprehensively studying the basic marketing theory. The author concludes MM-TIP model from marketing theory. The specific meaning of each letter is as follows:

M: Mobile Internet (Including: Convenience Communication Relevance Reaction Relation)

T: Tourist (Including: Customer CS)

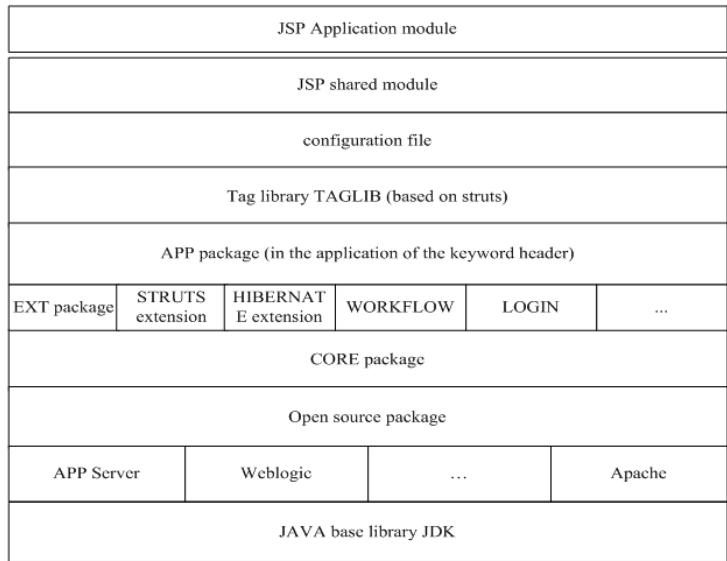


Fig. 3. Organizational Structures of the Platform

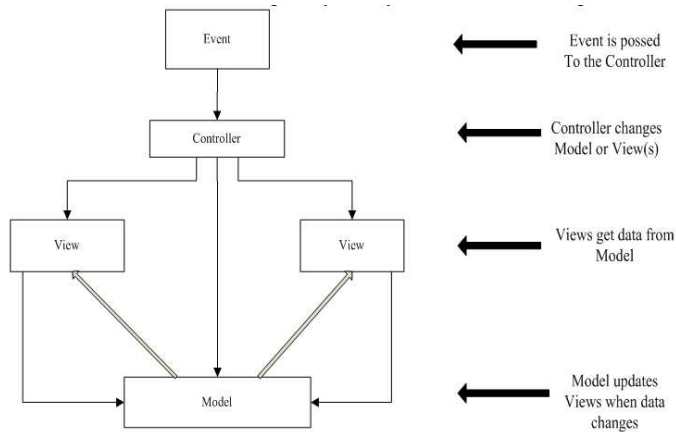


Fig. 4. MVC Architecture Model

I: Tourism Image (Including: CI)

P: Tourism Product (Including: Value Versatility)

In short, MM-TIP model is a tourists-oriented marketing model for promoting the tourist image and the products sales.

In MM-TIP model, the 1st letter “M” refers to mobile internet by which tourist, tourism business and tourism managers are all connected. In view of its special technical characteristics, mobile internet, as a convenient platform for marketing and communicating, generates a direct relation with users and can timely feedback users’ experience and requirements.

MM can also be expressed to mobile internet marketing.

The 2nd letter “M” refers to marketing. As an important part of tourism marketing, it includes price, cost, channels, promotion, returns, difference and resonance relationship of tourism and other elements.

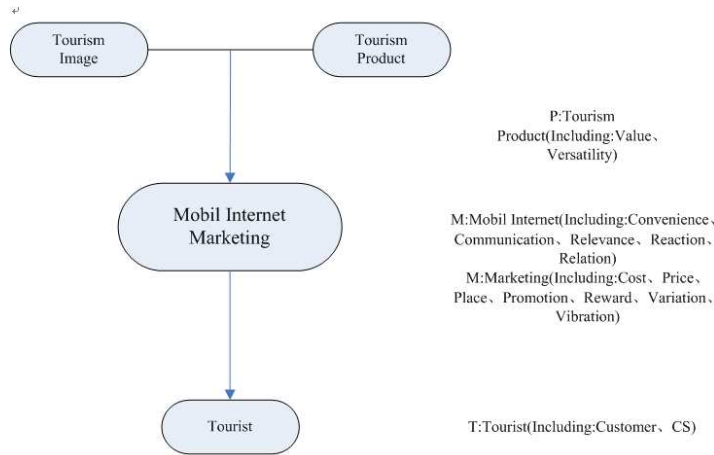


Fig. 5. Architecture Diagrams of MM-TIP Model

3.3. Application of Tourism Marketing Platform Based on Mobile Internet— Taking WeChat as an Example

The development direction of Wechat Marketing was one-direction attention and transferring in the past. This one-way development is changed into a two-way interactive pattern due to some elements like tourists with more dependent on network, with stronger subjective initiative, with poor ability of integrating and distinguishing information and the development of tourists personalized demand. Therefore, tourism organization can launch effective marketing plans according to MM-TIP model. Wechat is also an important carrier of tourism marketing in the following 5 different phases: getting travelling information, making connections with tourism business, purchasing tourism products and sharing travelling experience. Therefore, the construction of MM-TIP model can be divided into 5 phases in Figure 6.

Before travelling, tourists can choose scenic spots suiting themselves by knowing previous tourists' travelling arrangements from Wechat. The application can recommend scenic spots, destinations, travelling routes to tourists so that they can quickly plan their traveling itinerary. Combing others' travelling sharing with own interests and preference, finally, tourists determine their routes by comparison of different scenic spots. Also, those recommend scenic spots by Wechat are propagated to a certain extent. This method can save tourists' time and energy. Even if getting into trouble during travelling, tourists can feel comfortable due to others' similar experiences and the decrease of unnecessary troubles. Flow diagram of the system is as follows:

In tourism management system, when opening Wechat, users can enter into home-

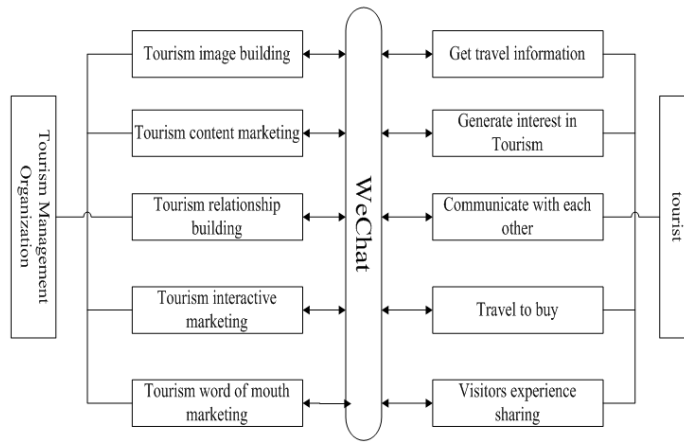


Fig. 6. Wechat Marketing Model of Tourism Based on MM-TIP Model

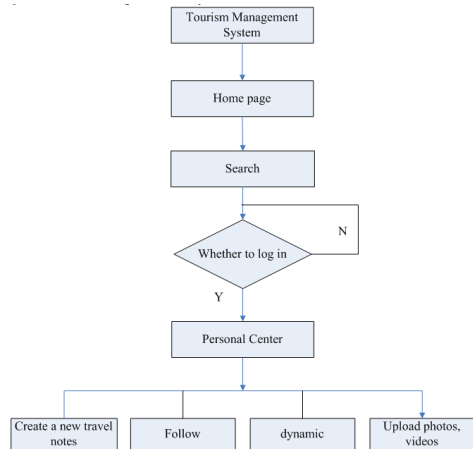


Fig. 7. Flow Diagram of the System

page to see different recommend scenic spots like Lhasa, Guilin, Maldives and other beautiful cities and countries. As the same times, users can enjoy the photos and comments of tourists from all over the world and their travelling routes. In addition, if you have a define destination, you can search for it and related services like hotels, visa, travelling equipment, photography, cycling, diving and so on. Before entering personal center, users need to login in the page. If users don't have an account yet, visit the registration page to sign. Once users 'login is successful, they can access to establish new travel diary and share travel experience. Also, users can focus on tour pal what they interested in, can comment their recent situation and may get the reply from tour pal and related suggestions. In personal center, tourists can upload photos and videos what they like and can collect some scenic spots what they interested in. the flow diagram of tourism management system is as Figure 8 follows:

The functional design of all system clients includes 5 parts, namely: “home management”, “search management”, “tourism management”, “user login” and “personal center”.

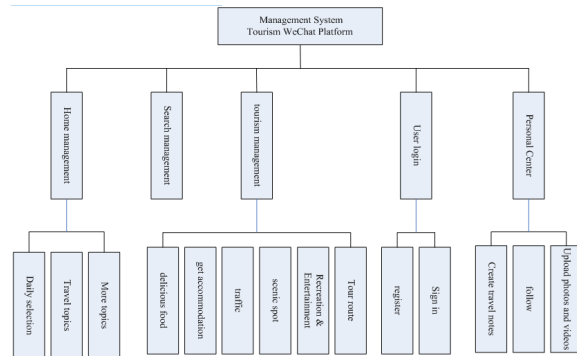


Fig. 8. Framework of the System

In the module of tourism management, after entering to homepage and search page, users can enter into tourism management interface to click the press of tourism management. After finishing these steps, users will enter into another 6 sub-modules: “delicious food”, “get accommodation”, “traffic”, “scenic spot”, “recreation & entertainment” and “tour route”

4. Conclusion

This paper is devoted to a research on the construction and application of tourism marketing platform based on mobile internet. By analyzing mobile internet mainstream technology and its application in tourism marketing, the author constructs the platform system of tourism marketing based on the mobile internet. The architecture of marketing system uses MVC pattern with a three-tier distributed structure and logic layer of the system use the construction of JavaBean and EJB. The author fully analyzes and building MM-TIP model based on the marketing theory and provides a relatively perfect marketing plan of tourism based on the mobile internet. In this plan, Wechat is applied tourism marketing by a combination of scenic spots managers and tourists. Applying the advantages of mobile internet to tourism marketing is to maximize the impact on propagating scenic spots and is to provide convenience for tourists. The results of the paper provide some reference for constructing marketing platform of tourism based on mobile internet.

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