
Develop a Cloud Tourism App for Sanyi Township, Miaoli County

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ABSTRACT

This study used the farms of Sanyi Township, Miaoli County, as the theme, and collected information of existing locations and services to develop an App, in order to help customers plan trips and make reservations on farm restaurants and accommodation.

Based on the analytic hierarchy process (AHP), this study first determined the hierarchy architecture and the weight of each dimension and indicator, and selected the indicators with total weights higher than the average value as the basis to design the App. Tourists were invited to use the App, and then fill out the questionnaire. The collected data were analyzed with statistical software, and the acceptability of the App by the users was examined.

Based on results analysis, this study further discussed the major factors that affect Miaoli County's tourism App system. Suggestions were provided to enterprises and future studies.

Keywords: Cloud Service, App, AHP, Tourism

INTRODUCTION

Under the advancement of information technology and e-commerce, as well as the two-day weekend policy implemented by the government in Taiwan, various types of tourism websites have been developed. Moreover, as the popularity of smart phones has drastically changed people's lifestyles, it is expected that smart phones will change the world. Miaoli County has been actively promoting its tourism industry. This study focuses on the tourism farms of Miaoli, and aims to develop a tourism App system.

The tourism App integrates the distributed cloud-computing model, so that the data module sent by users could trigger the cloud database center to provide services through active, scalable, and virtualized operational resources. In order to let users quickly learn about the tourist spots and surrounding farms, this study used QR Code in the App system. Users can use smart phone cameras to scan the QR Codes and access multimedia itinerary information, learn about nearby farms, make reservations on restaurant or accommodation, and explore local industrial characteristics, cultural preservation, or educational related attractions.

The proposed App is expected to provide services to self-guided travelers in travel planning and room reservation before they visit Miaoli. It can provide real-time and customized services for multimedia travel, as well as restaurant and accommodation reservation.

Literature Review

This section contains five parts: Section is website features, cloud computing, QR Code, App and analytic hierarchy process (AHP).

Website Features

The functions and features of a website are summarized in Table1:

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Table1. Website features

Author and Year	Contents
Eighmey and McCord (1995)	User satisfaction evaluation by four website features, including in formativeness, entertainment, ease of use, and timeliness.
Eighmey (1997)	Aan overall evaluation by the five dimensions of a website, including reliability, entertainment value, marketing perception, ease of use, and interactivity.
Hsu (1997)	There are five dimensions for evaluating websites, including convenience, reliability, communicability, internality, and technology.
Huang (1998)	Tourism quality should considered and promoted from consumer’s angle, and a tourism website should contain five features, including directory index, information contents and updates, proper distribution of figures and text, interactive contents, and ease of use.
Liu (1999)	A tourism website should contain six dimensions, including correctness, content, personalization, visibility, convenience, and entertainment.

Cloud Computing

The main feature of cloud computing services is “use as needed, and pay as use”. Users can store and retrieve cloud resources at anytime from anywhere through Internet, and the cloud can quickly distribute needed resources according to conditions of use. Users only pay what they use.

QR Code

It is a two-dimensional bar code developed by a Japanese company, Denso Wave, in 1994. A simple pattern or mall picture is displayed after a QR Code is scanned. The QR Code is mostly used with mobile phones. The mobile phone’s camera function and internal identification software are used to scan QR Codes. A Smartphone user can receive a large amount of information instantly through a click.

App

App is a mobile phone application program designed for tablet computers, smart phones, and other mobile devices. The Apps in the market today are majorly for iOS operating system developed by Apple, and Android operation system developed by Google. They provide the convenient user interface to let users operate programs directly to perform functions.

AHP

AHP was proposed by Prof. Saaty, and is mostly applied on decision-making problems with uncertain conditions and multiple criteria evaluations. There are five steps (Saaty, 1980):

1. Defining issues: Analyze problems, including all potential influential factors, and define the scope of the problems.
2. Building hierarchy architecture: Collect related data, and analyze the data to find important intersections; categorize the decision problems, evaluate the mutual and independent relation among all factors; analyze the problems by hierarchy architecture.
3. Designing questionnaire and survey: According to different hierarchy, proceeding on pair wise comparison in every hierarchy using previous layer hierarchy as its evaluating criteria. If there are n criteria, then $(n(n-1))/2$ pair wise comparisons need to be proceeded.
4. Verifying hierarchy consistency: Build pair wise comparison matrix according to the results of the questionnaire survey; compute the relative weights among all factors, and apply to solve the eigen value and eigenvector. In order to further decide the consistency of the questionnaires results from interviewees, Saaty verified the results by consistence indicator (C. I.) and consistence ratio (C. R.).
5. Computing the total prioritized vector of the entire hierarchy: Integrate the relative weight of each hierarchy factor to calculate the total prioritized vector of the entire hierarchy. After quantizing complicated decision problems, the output data represents the relative priority of all decision schemes vs. decision target.

Research Method

This study collected related literature, and adopted the AHP to determine the hierarchy architecture and the weight of every dimension and indicator. The indicators with total weights higher than the average value were selected as the basis of designing the app. Tourists were invited to fill out the

questionnaires after using the App. The collected data were analyzed by statistical software. The procedure steps are described as follows:

Step 1: Building AHP hierarchy architecture

Based on literature review, this study organized four dimensions of the hierarchy architecture of AHP, including site map information, transportation information, online service, and interactive sharing. The 14 indicators are shown in Figure 1:

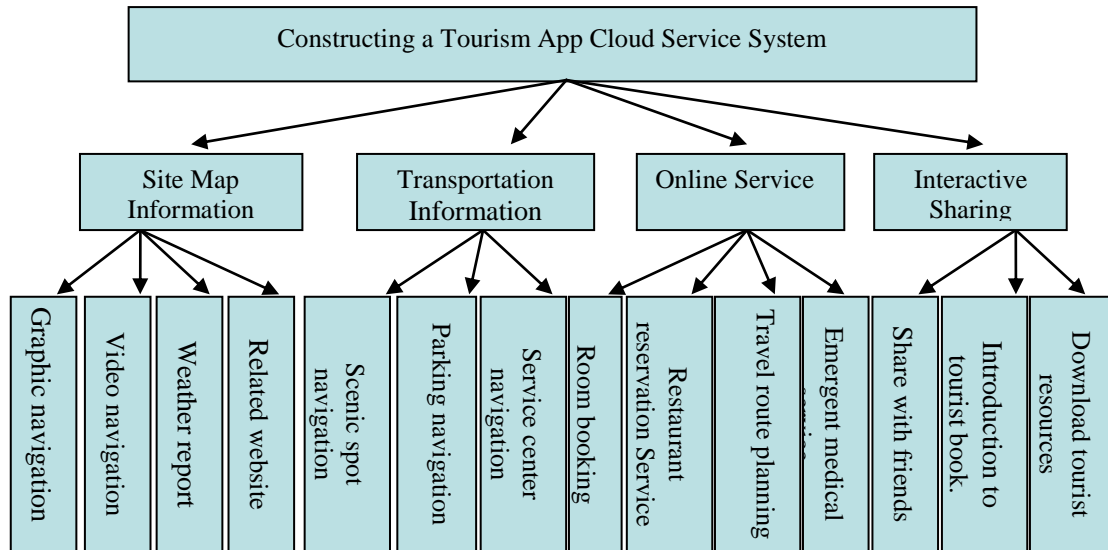


Figure1. The hierarchy architecture diagram of the research

Experts were invited to fill out the hierarchy analysis questionnaire, and 26 samples were collected. After weight analysis, the results were used as the framework of designing the App system. The inclusion criteria of the experts are as follows:

1. A person who is in charge of or undertake a website design position for a travel agency or a tourism website for more than 3-year of executing experience.
2. A person who is in charge of or undertake tourism related business for a governmental institute or a private business for more than 3-year of executing experience.
3. A person who works at a teaching position related to leisure tourism for more than three years.

Table2. Expert list

Field	Unit	Title	Persons	Ratio
Industry Practice	Resort hotel alliance	Manager, and staff	2	38.5%
	Travel agency	Manager, Sales Representative, and Marketing Specialist	4	
	Website design studio	Owner and webpage designer	3	
	Travel commercial trade association	Board Director	1	
Government Organization	International Culture and Tourism Bureau, Miaoli County	Officer and staff	4	38.5%
	Tourism Bureau, MOTC	Director and staff	4	
	Taiwan Railways Administration	Conductor and Train captain	2	
Academic Orientation	Visual Communication Design Department at University of Science and Technology	Assistant Professor	1	23%
	Leisure Business Management Department at university	Assistant Professor	1	
	Multimedia Design Department	Teacher	1	
	Leisure Business Management Department at University of Science and Technology	Assistant Professor	1	
	Leisure and Tourism Management Department at University of Science and Technology	Assistant Professor	2	

According to the results of expert survey, the weights of the second and third layers were obtained. Then, the total weights of the 14 indicators were calculated. The items with weights lower than average value 0.071 were deleted, and only the indicators with weights higher than average value

were retained to be the framework for constructing the App system. These are described in Table 2 as below:

Table3. AHP indicators list

1 st level	2 nd level	3 rd level	Total weight	Results
Goals	Dimensions	Indicators		Retained or Deleted
Constructing a Tourism Mobil App Cloud Service System	A .Site Map Information	A1. Graphic navigation	0.130	Retained
		A2. Video navigation	0.087	Retained
		A3. Weather report	0.052	Deleted
		A4. Related website	0.03	Deleted
	B. Transportation Information	B1.Scenic spot navigation	0.165	Retained
		B2.Parking navigation	0.095	Retained
		B3. Service center navigation	0.044	Deleted
	C .Online Service	C1. Room booking	0.131	Retained
		C2.Restaurant reservation Service	0.073	Retained
		C3.Travel route planning	0.082	Retained
		C4.Emergent medical service	0.027	Deleted
	D. Interactive Sharing	D1.Share with friends	0.072	Retained
		D2. Introduction to tourist book.	0.017	Deleted
D3. Download tourist resources		0.004	Deleted	

Step2: Construct the module architecture of the App system platform

According the selecting indicators of Table 2, the platform module architecture of the App system For the research is shown in Figure 2.

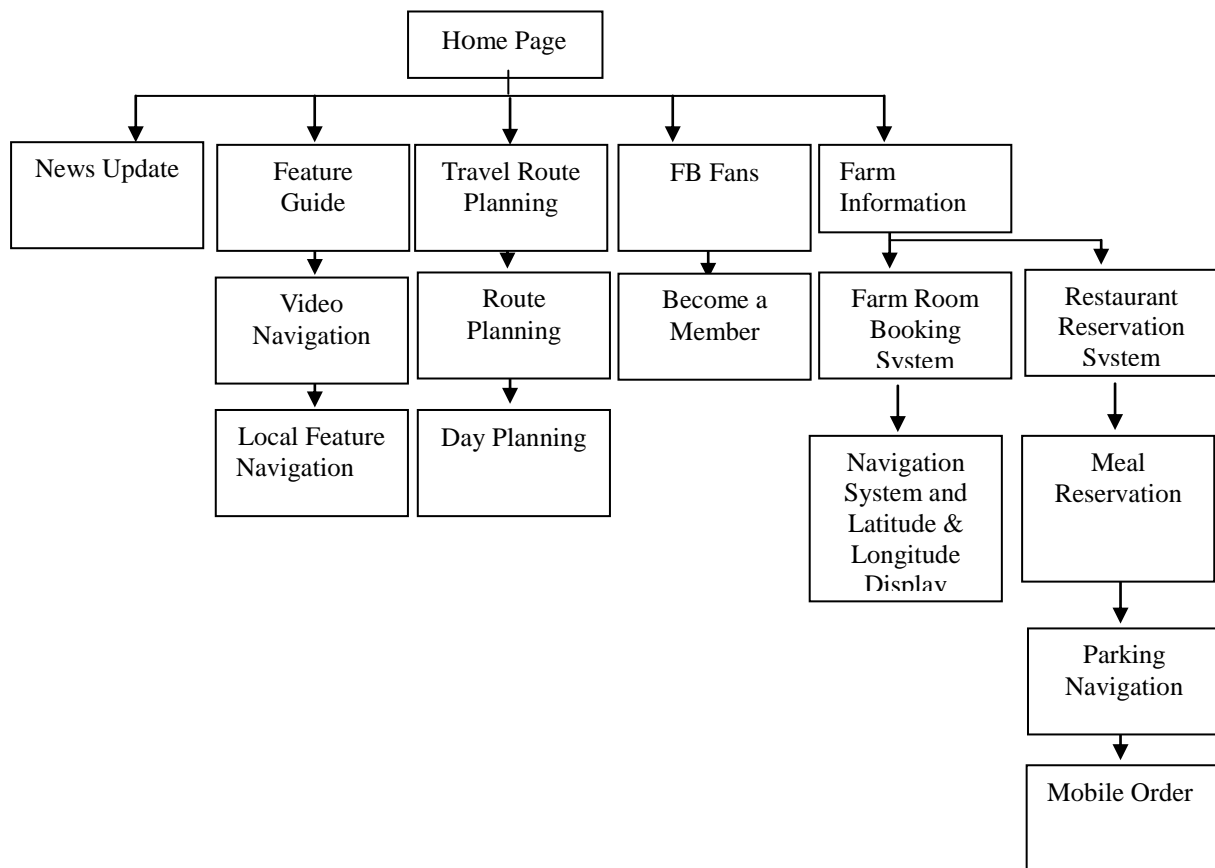


Figure2. App system module architecture diagram

CONCLUSION

Based on the results of data analysis, this study discussed the main factors that affect the tourism App system for Miaoli County, and provided suggestions for enterprises or future studies.

According to the average scores “Scenic spot navigation” receives the highest score. It is suggested that the App developers should integrate voice and video functions to expand the user interface model

by interaction. It shows that the tourism App system meets the market trend and satisfies users. Overall, the result provides reference for developing new Apps.

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