

The Integration and Development of the Leisure and Hospitality Information System Module with the Embedded Technology

Chih-Yao Lo

Department of Leisure Management, Yu Da University
No. 168, Hsueh-fu Rd., Tanwen Village, Chaochiao Township, Miaoli County, 361 Taiwan

Abstract—The tourism in Miaoli has been in great development recently. The wonderful scenery and other potential conditions have sufficient incentives to attract tourists. Though there is such a huge tourist economic market, most tourist service providers are unfortunately not able to integrate the information technology and the tourist services effectively. Therefore, we guide the tourism industry “Case Company A” to put our research results into practice to help the traditional farm “Case Company B” proceed a overall improvement and build a brand new commercial image. The embedded technology is used to set the leisure and hospitality information system into its existing website to make market segmentation. And the Flash and AJAX technologies are applied to build a Miaoli Virtual Reality Traveling Guide Website to make “B” an E-leisure farm with competitive advantages. With the information technology, we expect to offer abundant information of the leisure farm to people. The online journey planning function coupled with the animation design and real images of the journey makes visitors be immediately attracted by the beauty of the scenery, lots of mouth-watering cuisines, local cultural activities, etc. and thus the purpose of tourism development will be achieved.

Keywords- travel planning; E-leisure farm; embedded technology

I. INTRODUCTION

Technological developments have led "information technology" no longer to be just a symbol of industrial progress, but become a necessary tool to make a living. It's confirmed that effective information systems will promote more competitive advantages of the industries. In recent years, with the international progress and transition, many tourism industries have also followed changes or restructured the existing agricultural mechanisms which do not cope with the agricultural evolution of the changing times. The traditional farms make use of the rural landscapes, ecological and environmental resources, rural cultures and rural life to provide tourists a leisure and the best traveling spot [1].

Due to the development of information technology, a variety of travel sites have been springing up. These sites offer a wealth of traveling information and related services to tourists. Some established by private companies generally provide package tourism products, and some set up by the government basically supply the suggestions of the journey plans and the information about the attractions and routes with static images. However, even there are so many travel sites provide different types of travel information and services, a survey for Internet users pointed that the boring scenic spot introduction is the most dissatisfying part of the site design. The majority of Internet users commonly considered that traveling spot information is the most important part of the tour planning and a well-done presentation could effectively enhance their willingness to take a trip to the region [2].

Leisure Hospitality Information Systems are digital nervous systems of the management and operation in leisure tourism, and conduct the whole working process of the leisure farm and traveling website. With Leisure Hospitality IT system, managers can get a whole picture of the farm operating conditions, such as the customers' needs, the workers on duty, the financial situation, challenges from the competitors, etc. and then make thoughtful business strategy in good time. Leisure Hospitality IT systems combine hardware with software and provide precise, direct and extensive information to managers. All the information will enhance the insights and productivity of the operating process [3].

Therefore, in this study, we make efforts to design a leisure hospitality information system to provide the farm managers a digital nervous system. The outlines of its constructing approaches are as follows:

1. In this research, we assist the tourism industry “Case Company A” to put our studied results into practice to help the traditional farm “Case Company B” proceed a overall improvement, build a brand new

commercial image, and make market segmentation. We expect to achieve the goal of making the "Case Company B" into an E-leisure farm with competitive advantages. First, we adopt the professional landscape design expertise of a certain "Landscape Engineering Co., Ltd." to proceed the environmental planning, the overall image re-packaging, and the market positioning for "Case Company B." After the above conditions are all set well, the dining information system is built by taking those into consideration. And the dining information system is embedded in the company's existing site to run the catering.

2. We make use of Flash and AJAX technologies to build the Miaoli Virtual Reality Traveling Guide Website. The tourists' consumption modes and the market demand information provided by the "Case Company A" are the planning and constructing basis of the Virtual Reality Traveling Guide Web site. The Flash and AJAX technologies are used to reprocess the web page.

II. LITERATURE REVIEW

The leisure and hospitality information systems require the relevant theoretical concepts and technologies, including farm environmental planning, reality travel guide and dining information systems. The analyses are as follows:

1. Farm Environmental Planning

The environmental planning is the fundamental measures to prevent the environmental pollution and ecological damage during the process of rural industrialization and urbanization. It is based on environmental conditions and set to achieve the target of improving the environmental quality. The environmental planning was made according to the ecological principles by taking the economic development and the environmental protection into consideration. By means of the analyses of the environmental systems, it is able to develop the best environmental protection programs. The purpose of environmental planning is to control the activities of human beings, reduce pollution, and prevent resource damage, and thereby protect the environment for human living. With the development of environmental planning, the economic development can be reconciled with the environmental and ecological protection. To strengthen the macro control and management of the environmental planning is the solution to solve business and environmental pollution problems, and protect the ecological environment of animal husbandry, forestry and fisheries industries and the natural ecological environment. The natural resources will be under rational development and sustainable use. The environmental benefits, economic benefits, and social benefits will be consistent as well.

2. The Virtual Reality Traveling Guide

Issues related to the tourism industry are connected with many disciplines, such as psychology, sociology, and the marketing management. The psychological points of views interpret the tourists' needs. The observed phenomena of sociology or the product market segmentation and diversification strategy proved by the marketing management are for the purpose to meet all travelers' need. Therefore, to understand what the travelers' need is the most important issue to draw their attention and get their visits. The main purpose of a trip depends on the various needs of the travelers, such as leisure, sports, and even self-realization. The most widely accepted classification is based on the conference resolution of the 1963 United Nations International Travel and Tourism Conference, held in Rome. It shows the traveling classification criteria are the tourists' ways of stay, and days of travel [2].

We take the official record into consideration and sort out the possibilities of the travelers' need in reality. The results show that the traveling ways will be different on account of the number of traveling days, traveling purpose, and travelers' age, etc. Therefore, the traveling phenomenon can be classified into the following types:

1. Number of visitors: personal tour, group tour
2. Purpose of traveling: entertainment sightseeing, leisure tourism, cultural tourism, recuperation tourism, sport tourism, conference tourism, social tourism, business tourism, political tourism
3. Transport: land tour (bus, car, train), sea and river sightseeing, aerial sightseeing
4. Location:
 - (1) domestic tourism (national tourism):
the traveling activities of the natives or the foreigners who live in the country
 - (2) regional tourism:
the traveling activities in a region which is including different countries, i.e. the tourism in Western European countries
 - (3) international tourism:
the traveling activities between different countries in the world
5. Age (the age influences the needs and habits): youth tourism, adult sightseeing
6. Gender: male tourists, female tourists

7. Prices and social class: luxury tourism, middle-class tourism, mass tourism
8. Source of tourists.
9. Effects of the trade balance.
10. Length of the period of temporary residence.
11. Limits of freedom of movement.

3. Ajax Technology

Ajax is the technology making use of JavaScript or XHTML to control the homepage. February 2005, Jesse James Garrett first created the term "AJAX" in his article: Ajax: A New Approach to Web Applications. It's not well known until Google released Google Maps and Google Suggest on Google Labs. Today, there are many developed Ajax design frameworks and tools for downloading and applications on the Internet. Furthermore, related books have been published in the world. It is convinced that Ajax will lead the web programmers to bring about more research and application [4, 5].

This research adopts Microsoft VISUAL STUDIO 2008 and AJAX CONTROL TOOLKIT to develop the integrated environmental development. AJAX CONTROL TOOLKIT is the combination of the templates and components which are provided free by Microsoft. Through its built-in control device (EXTENDER), the mass client web page with AJAX functions can be easily established [6]. The development steps of the AJAX system are shown in Figure 1.

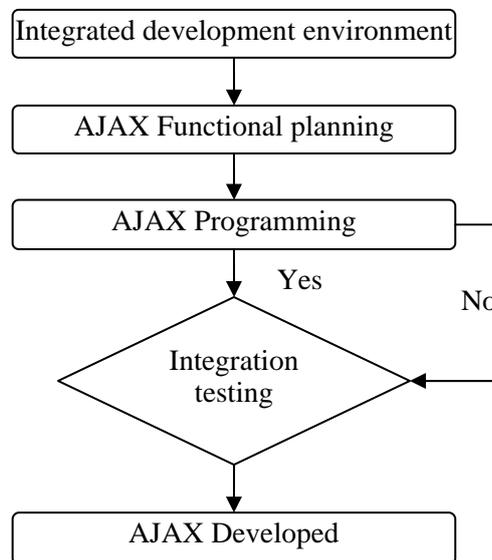


Figure 1. AJAX system development steps

4. GPS Technology Principle

GPS is a three-dimensional locating technology. It accepts the information transmitted from the satellites in the space, and then sends the information to the receivers of various types of download machinery (aircraft, ships, vehicles or cell-phones, etc.) With the data, the GPS system can calculate the receivers' location. GPS satellite locating system adopts three-dimensional locating methods. According to the general triangulation principle and the information from two different satellites, the two-dimensional location can be calculated. But to correct the locating errors and modify the deviation, the information of the third satellite is usually added to calculate. Similarly, in order to calculate the most accurate three-dimensional location, the information of the fourth satellite is usually used, in addition to the third one.

III. METHODOLOGY

This research centers on how to transform a traditional farm into a leisure farm. The method to carry out this study is using the information technology of ASP.NET, AJAX and FLASH to build a virtual reality traveling guide website and do the travel planning. In order to complete and perfect the virtual reality traveling guide website, we embed the dinning information system, meal reservation module, and the parking navigation module into the website and proceed the integration. The established structure is presented as Figure 2.

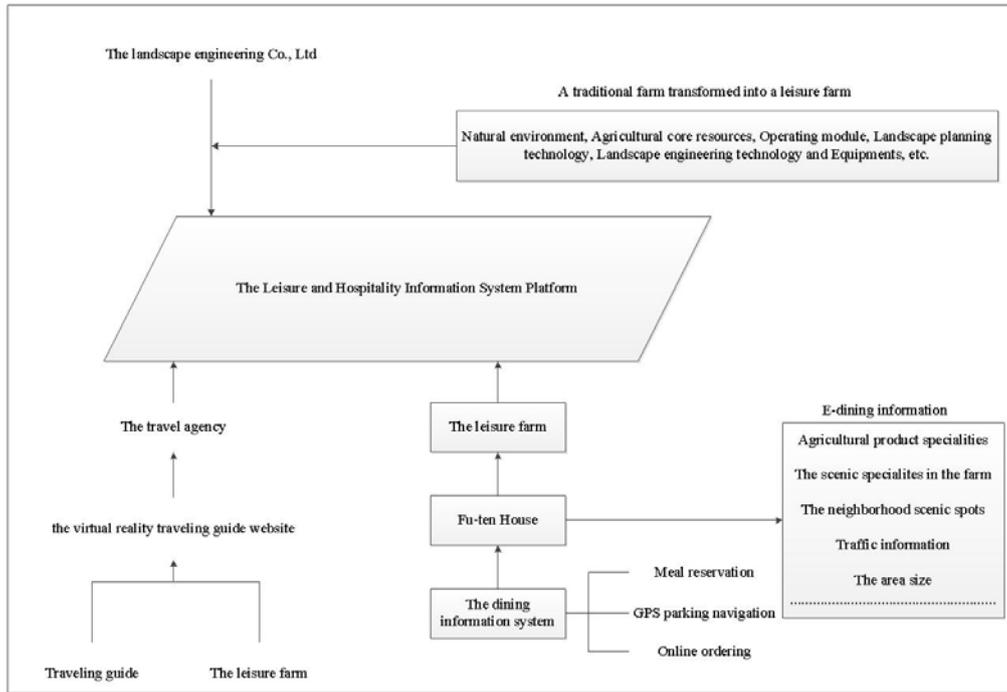


Figure 2. The Leisure and Hospitality Information System Platform Structure

In this work, we employed the system development life cycle (SDLC) method to build the leisure and hospitality information system, and the proceeding steps are as follows:

1. Problem identification:

We first make efforts to study the necessary conditions and requirements for establishing the leisure and hospitality information system. By visiting "Case Company A" and "Case company B", we get the chance to know the operating processes of "Case Company A" and the restaurant operating procedures of "Case company B". Through the cooperation with "Case Company A" and "Case company B", we can not only have a deeper understanding of the information of the agricultural leisure tourism in Miaoli but also establish the new information system which is closer to the market demands in Miaoli.

2. Feasibility study:

The feasibility of this study is determined by the analyses of the economic feasibility, technical feasibility and operational feasibility.

1. Economic Feasibility:

To create a new system, the cost of money is inevitable, and the system maintenance cost in the future is also not to be underestimated. This study analyzes and compares the advantages and disadvantages of the cost benefits between the "manual operations" and "information system". However, the necessary data of the assessment cover a wide range and it's difficult to estimate the details. In the case of limited time, an eclectic way is used to assess the cost benefits, and the comparison is as the following Table 1.

TABLE I. THE COMPARISON OF THE ADVANTAGES AND DISADVANTAGES OF THE COST BENEFITS BETWEEN THE "MANUAL OPERATIONS" AND "INFORMATION SYSTEM"

	MANUAL OPERATION		INFORMATION SYSTEMS	
	Cost	Benefit	Cost	Benefit
Technology Cost				
Hardware	N/A	N/A	High	High
Software	N/A	N/A	High	High
Professionals	N/A	N/A	High	High
Resource Cost				

Material	High	Low	Low	High
Time	High	Low	Low	High
Labor	High	Low	Low	High
Switching costs				
Training	N/A	N/A	High	High
Popularize	N/A	N/A	High	High

As shown in the above table, although the deployment of information systems needs more technology costs, it provides much higher operation efficiency than the traditional manual operation. The information system is able to save resources and minimize the waste of papers in particular. Considering of the benefits of the high efficiency, the cost of the system deployment is trivial comparatively.

2. Technical Feasibility:

The technical feasibility is examined by the technology required to establish the leisure and hospitality information system in this study, such as the operation system platform, programming languages, database management systems, etc.

3. Operation Feasibility:

It is the analysis whether the leisure and hospitality information system could assist customers and tourism industry to understand the travel contents and dining information in Miaoli leisure attractions. And to determine whether the functions provided by AJAX can achieve the purpose of virtual reality guide.

4. System analysis, implementation and maintenance

The supervisor, employees and customers are the users of the system. The findings from our research suggest that the users' acceptance for the system is the most important subject for analyzing. The data of the users' expectations or criticism are obtained by interviewing the staff. The factors such as the beauty of the image, the operation of the interface, etc. will influence the uses' reception and judgment on the system. And these factors are also used as reference to establish Internet services and maintain the system. That is, if all the users accept the operational processes and changes deployed by the information system and then the system will achieve the expected results [7,8].

According to the requirements of the enterprise and customers, we establish a prototype of the dining information system and embed it in the current page of "Case Company B". The purpose of this procedure is to confirm the feasibility, integrity and suitability of the system. And the other aim is to enable "Case Company B" to clearly understand the functions of the system and whether it fits all the users' demands. Its system structure is shown in Figure 3.

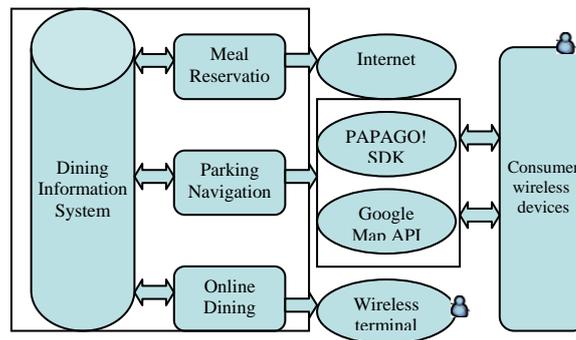


Figure 3. The dining information system structure of "Case Company B"

IV. RESULT

The system images and the benefits of establishing the leisure and hospitality information system of our research are as follows.

1. Online Meal Reservation System

On holidays, the leisure farm is always crowded with people. Although the meals are served in turn according to the sequence of the ordering, most customers can't wait and have already lost the appetite while waiting for the food. This situation affects the overall service quality. In view of this, the online meal reservation system provides customers to make reservations three days earlier. The system mainly provides services such as to browse meals, to select meals, to set dining time, and to view the completed ordering, etc.



Figure 4. Online Meal Reservation System

2. Table Status Management System

Table Status Management System mainly provides the services such as to add or subtract the number of tables, to order meals, to log in the accounting system, to register the reservations, etc.



Figure 5. Table Status Management System

3. Meal Management System

Meal management system is mainly to provide the services of modifying and increasing meal information.



Figure 6. Meal Management System

4. GPS Parking Navigation Module

After finishing the online ordering, the system will automatically allocate and reserve parking spaces to consumers and set the retention period. The number of parking spaces updates automatically by the system, and the managers and customers can make inquiries through the system interface. When the internal parking spaces are all occupied, the system will provide GPS Navigation Service to the customers, and allow the users to choose their preferred navigation systems. The system adopts the well-known cross-platform navigation system PAPAGO! and builds GOOGLE MAP API, the simulate navigation system, for other customers who use the other navigation system or without the navigation system[9,10].



Figure 7. Navigation System Simulate Functions

The benefits and results of building and developing the system are as follows.

1. To transform into a leisure farm:

By means of the required data of planning and establishing a leisure farm such as the climate, soil quality, local culture, etc., we construct the analytical model to confirm the practicable implementation of the transformation. In this way, the neighborhood environment and the residents' living standards will be improved. And the consumers who come to experience the country life are capable of increasing the farmers' income and encouraging the community development. Furthermore, the natural environment and cultural landscape resources in this area will be under continuing protection and maintenance.

To create Database Module:

We build all kinds of databases which are necessary for establishing the virtual reality traveling guide system such as the customer database, the employee database, the travel spots database, the accounting database, the audio-visual database, etc. The customer analysis module is used to show the tourists' needs and preferences. The accounting system module is used to reduce the burden of the travel agency.

To analyze data and provide the best business decision-making:

The instant analysis module is mainly used to proceed the revenue analysis, marketing indicator quantitative analysis, and traveling spots quadrant analysis. The analysis tools can assist the tourism industry to adjust the marketing promotion strategy and get the instant traveling condition of any attractions in Miaoli. According to the large amount data of the tourists' needs and preferences, the module provides the feasibility and recommendations to the managers for making decisions.

To reduce business costs:

The online traveling reservation system module is used to assist the customers to make traveling reservation and reduce their time in searching and sorting. It can help the employees make right judgments on the customers' needs without any mistakes. The dining accounting system module is used to reduce the managers' burden of accounting.

To analyze the aptitude of tourists:

The tourist analysis module of the dining information system is used to show the customers' tastes and preferences. The meal analysis module can present the instant selling information of any dish or beverage. Through the analysis tools, the leisure farm managers will be able to make faultless decisions according to the useful data.

GPS providing new information:

The GPS Integrated Module provides the function to integrate GPS navigation system by connecting the external core components. The parking management module integrates the access control system of the parking lots and the automatic instant updating module, and contains management functions.

To enhance the speciality and quality of the leisure and tourism industry:

To enhance the sanitation and the living function of the area adjacent to the leisure farm is an effective way to promote the service quality and the market value of the farm. And it will lower the dilemma of the population outflow in the country and advance the local tourism competitive ability and the co-operative enterprises' market competitiveness. Through the online analysis module, the tourism staff can understand the contents of the relevant package tour, the financial condition and tourist' needs quickly and thoroughly. And the travelers will know much better about the tour content as well.

V. CONCLUSION

The virtual reality traveling guide website service and the dining information system embedded in the leisure farm are studied and developed in this research. We apply an advanced information platform and the system is adopted with the modular design. In this way, we can easily expand functions of the system in the future, and the system flexibility is increased substantially. Furthermore, the integrated operation interface also reduces the time needed for the users of the system learning and highly improves the overall operational efficiency in such a competitive leisure and hospitality market. Different types of catering services have various demands for information systems and the standard service procedures and cuisines will be able to reduce the complexity of the system design and the system maintenance costs. Above all, a perfect "dining information system" not only equips with sufficient hardware and software facilities, but completely integrates the management model and services.

On the consideration of the developing difficulty and maintaining costs, the WEB BASED structure is a more suitable system for this study. ASP.NET is used to develop the programming language and adopted in the PDA client of the wireless dining module. We make use of the AJAX to write the whole program of the GPS integration. By taking advantage of various forms, the high efficiency systems are developed in this study. The consumers can enjoy the brand new information services made from the combination of the developing technologies and the convenient and high quality service provided by the GPS navigation system. We can conclude with certainty that the results of this research are able to enhance the consumers' willingness to visit the leisure farm and create much more benefits for the transformed farm than the traditional one before.

ACKNOWLEDGMENT

This research was supported by grants from the National Science Council, Taiwan ROC (NSC 98-2622-E-412-004 -CC33).

REFERENCES

- [1] M. C. Lin, "A study of the marketing strategy for tourism oriented county-an example of I-LAN County", National Taipei University Master Papers, 2003.
- [2] J. L. Chou, "A Study of Taiwan Tourists' Backpack Travel Destination-Choice Behavior", Chinese Culture University Master Papers, 2006.
- [3] C. A. Hsiao., Y. T. Chen., 2004, "FOOD AND BEVERAGE COMPUTER SYSTEM", Yang-Chih Book Co., Ltd.
- [4] Kazuhiro. Furuhat., 2006, "Utilize the latest examples of JavaScript and Ajax Dictionary", DrMaster Press Co., Ltd.
- [5] H. L. Ling., 2006, "Practical manual-Ajax in Action ", Gotop information inc.
- [6] P. C. Shu., 2002, " Visual Studio .NET ", Gotop information inc.
- [7] M. J. Shu., 2000, "Marketing ethics and sustainable food", The 5th Symposium on Food and Beverage Management."81-100.
- [8] T. P. Kuo., 2004, " An Analysis of the Typology of Customer Satisfaction, Service Failure and Recovery in Restaurant Industry: A Study of Restaurants in Taiwan", Journal of Tourism Studies , Vol.10, 69-94.
- [9] Google Map, <http://maps.google.com.tw/>.
- [10] PAPAGO!SDK, <http://www.papagosdk.com>.