

***University Branding and Rural Tourism through the  
Interactive Information Kiosk System***

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**Abstract**

This paper discusses the use of Interactive Information Kiosk System on the development of university-based location in order to enhance tourism for the rural city in Taiwan. The Interactive Information Kiosk System is a touch screen technology relatively new for universities in Taiwan, particularly in remote areas. Further, the Interactive Information Kiosk System is suggested as an effective mechanism in providing update information and drawing attention to users. Place branding and subsequent image-building to a destination tend to be created by means of the Interactive Information Kiosk System. The university may create branding by employing this proposed system. Apart from serving as enhancement in giving out current information to staff and students of the university, the proposed system may attract visitors because of an interactive approach through its touch screen interface. In addition, the Interactive Information Kiosk System may have the potential to strengthen the tourism destination brand for the studied university.

Keywords: place branding, tourism, university, interactive information system

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## **Introduction**

Taiwanese government has been focused on promoting Taiwan as a tourist destination and continues to establish the country as an international tourist destination and will expect the expansion of inbound arrivals at an average annual rate of 5 % over the forecast period 2010 to 2015 (Euromonitor International, 2011). For domestic tourism, Taiwanese consumers have been gradually spending more money on travel and entertainment activities due to the economic recovery from the global financial crisis. According to Tourism Bureau, M.O.T.C. Republic of China Taiwan (2014), a number of inbound Taiwanese tourists increased approximately 10% while the total amount in tourist expenditures grew 5% to reach US\$ 1.23 billion over latest recorded period from 2012 to 2013.

As part of national policy regarding tourism, Taiwanese national government collaborated with regional authorities will continue to promote tourism in order to boost the entire country economy owing to perceived importance as a key income generator to local communities. This notion is confirmed by Cooper, Fletcher, Fyall, Gilbert, and Wanhill (2008) that tourism exponentially increased local economic growth opportunities. Lane (1994) also indicates that rural tourism has often been identified as a vehicle for protecting the countryside resource, enhancing the rural economy and maintaining rural ways of life. In this regard, Taiwanese government has provided assistance to local governments in establishing a comprehensive travel network since 2009 (Lai, 2010). With encouragement from the national government, most local governments actively sought to develop and promote their tourist highlights.

Rural tourism has been recognized as an emergent sector of tourism globally (Oh & Schuett, 2010) and is becoming interestingly topic to investigate (Polo Peña & Frías Jamilena, 2010; Sharpley & Jepson, 2011). Hence, the research objective is deemed to introduce the use of interactive information kiosk system in order to provide updated information about the university announcements and local tourist information.

## **Place Branding and Image**

A brand is particular product, service, person or place, augmented in such a way that the consumer perceives relevant, unique added values to match their needs. Brands convey a variety of meanings including attributes, benefits, culture, personality, and values. Furthermore, brands are market-based assets and therefore intangible assets of enterprises (Kotler & Keller, 2009). Schmitt (1999) suggests a place's brand refers to the sum of perceptions and cognitive associations resulting in memorable experiences linked to a certain place. Branding a place is an essential tool used to differentiate a specific place from competitors, to assist organizations gain sustainable competitive advantage (Grant, 2006; Hall, 2008; Hill & Lederer 2001; Park & Petrick, 2006), and more importantly to create image of the place in order to draw tourists' attention (Medway & Warnaby, 2008). This is consistent with Cai (2002)'s widely accepted definition about place branding as the development of a consistent element mix to identify and differentiate place through positive image building. Ashworth (2009) also asserts that the purpose of place branding is to find out or build some uniqueness different one place from others so as to achieve the competitive advantages. Branding place is the process of building an asset, and therefore place branding is recognized as

significant area of tourism marketing due to the competitive market settings and need for place differentiation (Mak, 2011).

Tourism is recognized as an image-driven industry (Elliot, Papadopoulos, & Kim, 2011). Additionally, image is considered as a key attribute of place branding and has been currently used to refer reputation or character of tourist places or destinations (Smith, 2005). In this regard, the success of tourist destinations resulted from a significant role of image because image serves to represent a simplification of a large number of associations and pieces of information connected with the place and fulfill a fundamental function in the choice process, as tourists generally have a limited knowledge of destinations to which they have not been previously.

According to Day, Skidmore, and Koller (2002), place image represents the sum of beliefs, attitudes and impressions that people have of a place. Selby and Morgan (1996) address that place image in tourism studies is classified into two dimensions: organic and projected. Organic image involves popular culture, the media, literature and education that tourists have been developed through non-tourism sources such as friends' comments, newspaper or television reports and magazine articles. Unlike organic sources, projected image comprises commercial sources such as travel guidebooks and various sources of advertisements that derive from deliberate effort of travel promotion by official tourist organizations.

Place image has also involved with rural tourism business. The use of images is likely to promote a rural tourism destination through providing rural tourists with things to do and attractions to visit and reinforce the contribution made by local traditions and customs in making a tourist's stay memorable (Garrod, Wornell, & Youell, 2006). Wheeler, Frost, and Weiler (2011) also suggested that branding of rural tourism should be driven by political agendas in response to the growing competition between places owing to the economic restructuring of market globally.

In this research, the interactive information kiosk system would be categorized as projected image that help local community to promote rural tourism industry in Taiwan. A key task of place branding is to differentiate a particular offering from other competitors and to create an attractive place image (Medway & Warnaby, 2008), and hence, the interactive information kiosk system set up in the university will make local community more distinguishable, attractive, and memorable among other competitors. This proposed system tends to create its place branding and subsequent image-building.

## **Conceptual Framework**

This study applied a conceptual framework to help build a model that attempts to explain how to utilize the interactive information kiosk system. The interactive information kiosk system acts as a portal for the flow of information from the university information center to the users, who can be direct and indirect. These users are the ones who access the information through storing and inquiring from the kiosk. The users can be tourists, students, faculty or any persons interested in more information about local tourist places and the university. The system possesses functionalities necessary for the requirements intended for its use. The transfer of data is a form of virtual communication from one end-user to another made possible

through the use of the interactive information kiosk system. Successful results are shown by means of qualitative data that is delivered to end-users. The output is a complete and updated post about activities and events fed to the information center. To add more is the reliability of the system which acts as an expert for information query and retrieval functionalities. Figure 1 provides an overview of the conceptual framework.

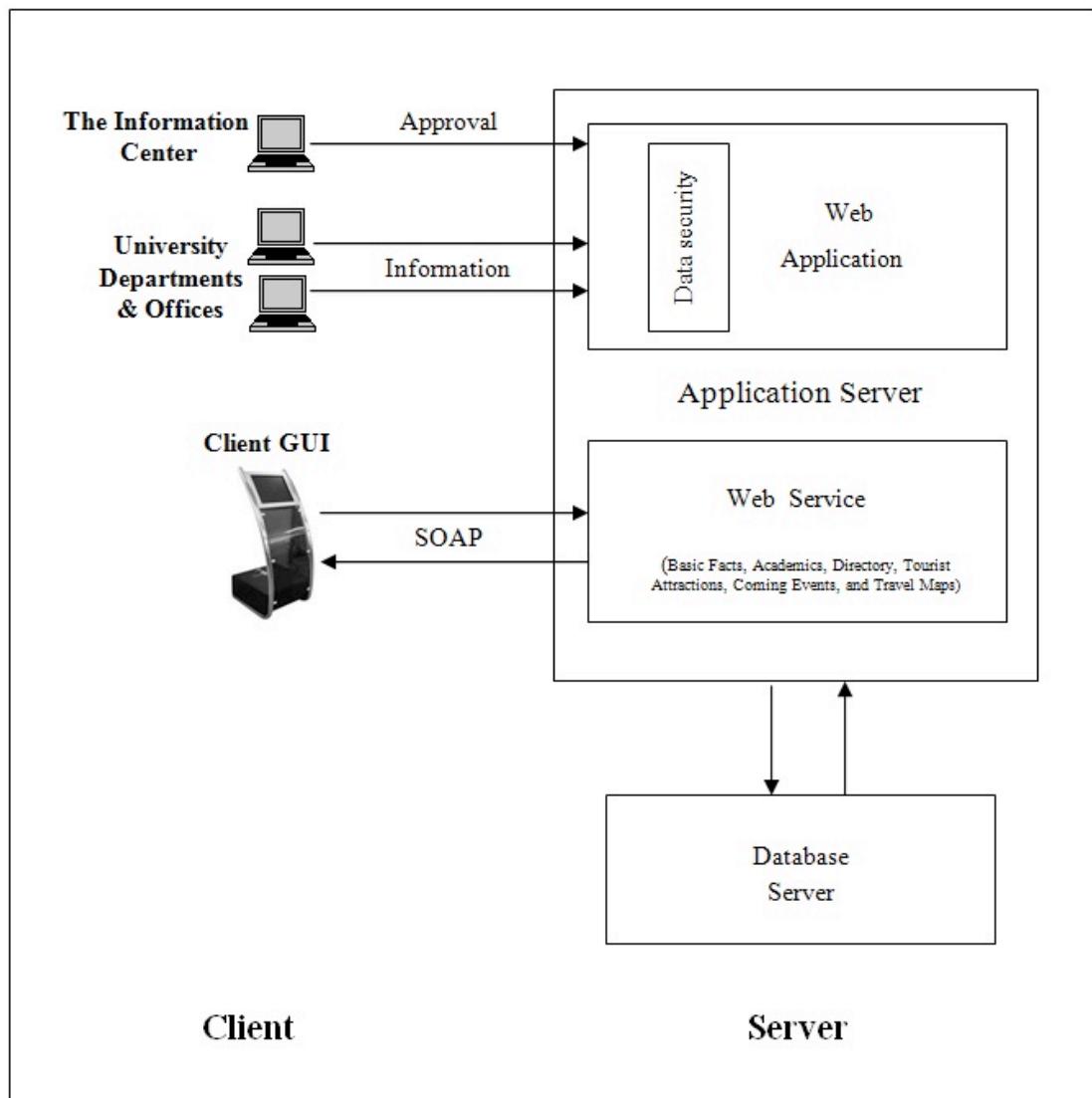


Figure 1: Conceptual framework-Interactive information kiosk system.

### **Data Security**

In order to achieve data security, a method of data encryption and the Adobe Flex Security is utilized in the interactive information kiosk system. Data encryption enables solely information center personnel, through password protection and authorization, to alter or adjust the database. Only the information center can load, change, and delete data from the database, which requires password authentication. For instance, other people may alter the information saved in the system. Users will be asked first to log-in and be prompted by a password. If password is incorrect, they will not be able to load changes on the information saved. In addition, the Adobe Flex

Security model protects both the client and the server. Adobe Flex considers the authorization and authentication of users accessing a server's resources, and Flash Player operating in a sandbox on the client. Authentication and authorization are given greatest importance. Authentication is the process of gathering user credentials and validating them in the system. This requires checking the credentials against a user repository. Authorization is the process of making sure that the authenticated user is allowed to view or access a given resource. If a user is not authorized to view a resource, the container does not allow access. Therefore, the Adobe Flex Security system helps the group in coding the system and manipulating the program easily in order to enhance security for the users of the interactive information kiosk system applicable only to information center personnel who will be directly loading the information.

### ***Instructional Design***

The instructional design to be applied in the proposed system originates from the principle of the cognitive theory of multimedia learning (Mayer, 2010). This theory encompasses several principles of learning with multimedia. In multimedia learning, the learner engages in three important cognitive processes: selecting, organizing, and integrating. The multimedia effect is consistent with the cognitive theory of multimedia learning because users who are given multimedia explanations are able to build two different mental representations, a verbal model and a visual model, and build connections between them. This result is consistent with the cognitive theory of multimedia learning because corresponding words and pictures must be in working memory at the same time in order to facilitate the construction of referential links between them. The stated principles are taken into consideration on how the graphical user interface (GUI) of the interactive information kiosk system is designed. Because a simple desktop or laptop is different on a touch screen, a plan must be made to refurbish the layout and GUI of the interactive information kiosk system. The GUI is carefully structured to guarantee user-friendliness, understandability, and ease of use.

### ***Service-oriented Architecture Protocol***

Service-oriented architecture protocol (SOAP) is a system used for exchanging XML-based messages over computer networks, normally using HTTP/HTTPS. SOAP forms the foundational layer of the Web services stack, providing a basic messaging framework on which more abstract layers can build. SOAP has several different types of messaging patterns, but by far the most common is the remote procedure call pattern, in which one network node (the client) sends a request message to another node (the server), and the server immediately sends a response message to the client. The use of SOAP in the proposed system is to be the client messaging framework. This can be seen in the conceptual framework wherein SOAP will be the messaging protocol of sending and receiving information at the client side. The use of SOAP will give the information dissemination functions greater flexibility and reusability. The interactive information kiosk system's common functions can be used easily and interchangeably.

### ***Web Service***

Web service is an interface for service-oriented architecture, in which Web-based applications dynamically interact with other Web applications using open standards that include XML running over HTTP, UDDI, and SOAP. Web Service is a software

system designed to support interoperable machine-to-machine interaction over a network. SOAP provides the definition of the XML-based format that can be used for exchanging structured and typed information between a Web-service client and a Web-service server. The use of the Web service relates to the client-server architecture of the interactive information kiosk system. Information query and retrieval is done with ease through the use of this service. Web service will be used to exchange data between the client and the server side. In this kind of controlled environment, the agreement on the data being passed through the Web service is easily obtained.

### ***Application Server***

An application server is a software engine that delivers applications to client computers or devices. In addition, an application server handles most, if not all, of the business logic and data access of the application. The main benefit of an application server is the ease of application development. Since applications need not be programmed, these applications are assembled from building blocks provided by the application server. The application server will be used in the implementation of the proposed interactive information kiosk system. The application server in the client/server environment will provide processing between the user's machine and the database management system.

### ***Database Server***

A database server is a computer in a local area network dedicated to database storage and retrieval and holds the database management system and other databases. Upon the requests from the client machines, this machine searches the database for selected records and passes them back over the network. The database server in the proposed system can be in the form of a computer unit with features and specifications that meets the requirements for installing the Windows Server. This will be used for storage of information as well as information retrieval.

### ***Client-server Architecture***

Client-server architecture introduces a database server to replace the file server. Using a relational database management system, user queries could be answered directly. The client-server architecture reduces network traffic by providing a query response rather than a total file transfer and improves multi-user updating through a GUI front end to a shared database. The client-server software architecture model distinguishes client systems from server systems. A client software process may initiate a communication session, while the server waits for requests from any client. The client-server architecture will be used in the implementation of the interactive information kiosk system. Rather than by approaching individual kiosks, the information center will have its own server which can load, change, or delete the information to be displayed by each kiosk.

### ***Shortest Path***

The problem of finding shortest paths in a graph has a surprising variety of applications. The most obvious applications arise in transportation or communications, such as finding the best route to drive between destinations. The shortest path algorithm is used in the proposed system to find a variety of ways or paths in order to arrive at a certain destination; wherein for every origin and destination which will be only one shortest path possible.

## **Methodology**

In developing the system, a rapid application development (RAD) was employed. The RAD is a team-based technique that speeds up information system development and produces a functioning information system. Further, the RAD is a complete methodology to information systems development, with a four-phase life cycle, which covers a complete life cycle from beginning to delivery and additionally parallels the traditional system development life cycle phases (Shelly, Cashman, & Rosenblatt, 2008), as described below.

### ***Requirements Gathering and Planning***

In the very first part of conducting the research, the team consulted the information center through its staff for the necessary requirements needed for the system. The problems encountered by the information center were gathered in this phase. The team observed that a touch-screen, stand-alone kiosk, cables and wires, and central processing unit (CPU) were necessary for implementation. The team used data-gathering methods such as personal interviews and observation. Brainstorming was also conducted and regular meetings of the team were done to further analyze if the system were possible and feasible.

### ***Design and Implementation***

Based on the requirements gathered, the team carefully planned and started considering the features of the system. Models were created representing the entire system process. The team first constructed the flow of the proposed system using a data flow diagram in order to have a better understanding of how the system should work. An entity-relationship diagram was used to design the database structure, and a functional diagram was used to determine the different modules to be included in the system. The basic layout of the interface or the GUI was created in this phase.

### ***Construction and Development***

During this phase, the team started the programming phase hand-in-hand with technologies released by Adobe Systems for the development and deployment of cross-platform rich internet applications. The team began the development of the MXML, XML-based user interface markup language to lay out the interface of applications. The system was open to more user feedback to check system faults and shortages as well as to check that requirements were being met to improve the system before continuing to the final phase. Feedback that was given by the users made the group go back to the design and implementation phase in order to consider the specified comments and suggestions.

### ***Introducing the System***

After all the testing has been completed, the interactive information kiosk system will be introduced to the users. The system will be deployed in the university and will be made available for the benefit of both the direct and indirect users such as the tourists, students, faculty staff, and other interested persons.

To be concluded, the RAD is the most appropriate approach for this proposed system due to its advantages of high interactive and low complexity. In other words, the RAD projects are recommended to be undertaken on applications that are highly interactive, have a clearly defined user group, and are not computationally complex.

## **The System**

The interactive information kiosk system is a stand-alone terminal display designed to provide information about the university and local tourist information to its users. Unlike traditional input devices such as keyboard or mouse, the information can be viewed by using only the touch of a finger. By using the touch screen interface, users will feel at ease due to fast accessibility and the touch screen interface will minimize latency or delay. The interactive information kiosk system will provide more updated, consistent, secured, and reliable information. This will help eliminate problems and misunderstandings regarding slow information delivery.

The default screen that displays whenever the interactive information kiosk system is idle serves as the system's main menu. This main window includes scrolling announcements and access to the following functions: Basic Facts, Academics, Directory, Tourist Attractions, Coming Events, and Travel Maps. These functions are briefly described in the following paragraphs.

*Basic Facts:* This function displays the university's vision, mission, and philosophy. In the subject of tourism, this menu contains tourist destination history, geography, and climate.

*Academics:* This function allows users to navigate through the different academic programs of the university including academic departments, graduate schools, institutions, and university policies. This menu includes the submenus such as admission requirements to the university, tuition, and payment for local students and foreign students.

*Directory:* This function is used for viewing the contact details and information of all the colleges and offices of the university. The information includes the landlines, trunk lines and/or email addresses.

*Tourist Attractions:* This function allows users to view and navigate through a variety of tourist locations. This menu includes the submenus such as tourist activities and restaurants.

*Coming Events:* This function is used for viewing a number of events and festivals throughout the countryside during the year. Events listed in this menu are always updated in dates, venues, and details.

*Travel Maps:* This function allows the user to select the origin and destination within the university or tourist places and computes the shortest path for the given points.

## **Discussion and Conclusion**

The proposed system introduces the multimedia and interactive information in locally-based sphere to benefit the rural tourism industry in Taiwan. The interactive information kiosk system uses a touch-screen interface to display and provide information about the university and regional tourist places to its users. The tourists will have an alternative to receive updated and current tourist messages via the kiosk system when they arrive even after the information center operating hours. Even

though today tourists habitually browse information regarding places to visit via the Internet beforehand, details of information in the Internet are sometimes sketchy. The interactive information kiosk system is designed for multiple-user purpose to be viewed by the users every time as information is newly posted in the system and kiosks are located in designated areas that can always be reached by users anytime.

Furthermore, tourist guide booklets, brochures, and promotional leaflets providing in the tourist information center are frequently not most current or latest due to the limitation of printing process. Seeing this need, the interactive information kiosk system gives a solution for an updated and interactive approach to information input and retrieval, serving the university and the local community through its touch-screen interface and local area network capability. Therefore, in order to replace the conventional practice in information dissemination, this study presents an interactive kiosk system that provides information access via electronic methods. The interactive information kiosk system may serve as an expert system for information query and retrieval. Additionally, the system in this study can also be regarded as an effective mechanism for rural tourism in attracting tourists to experience a new technology in a university site because this system has not previously been utilized among the universities in Taiwan for the locally-based tourism purpose.

For the benefits of university, the university's students, staff, and other users can search required information at anytime although the university information center is closed for the time being. Students also can make use of the system by enabling them to know more about the university's announcements posted by the university information center, which makes them well-informed. Potential students who visit the university site can benefit from the system to encourage them to enroll, and the system will serve as a gateway for them to gain more interest about the university. The university administration can also benefit from the system to disseminate information and provide data for students such as enrollment, payment, and other procedures and policies. Faculty staff can also view updated information on new university policies, events, and holidays. Finally, the staff of the information center can benefit from the system through an organized way of storing the files for announcements and securing these files through database storage.

The interactive information kiosk system may help create regional place branding and image-building as well as university reputation. Universities such as Harvard University and University of Cambridge fortunately have long legendary history so that this helps promote a number of tourists to visit their campus sites. However, for a newly-founded university, uniqueness should be created in order to enhance the university reputation. The university reputation is likely to enhance progressively and publicly since tourists from other places will recognize the university when they explore tourist information from this kiosk located at the campus.

Therefore, the ease of use, interactivity, and flexibility of this system should evoke tourist's attention in gaining innovative travelling experiences and eventually improve the perceived image of the rural tourism destination. Last but not least, this research presents an initiative for locally level tourism planning and development using the interactive information kiosk system in university-based location. In addition, local authorities can not only improve the quality of rural tourism service, but also reduce

cost for tourist information dissemination. Once this proposed system is implemented, potential benefits to the entire community may arise.

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