Opened Pins Recommendation System to Promote Tourism Sector in Chiang Rai Thailand

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Abstract—Internet and mobile technologies have significantly influenced the people in this century. This paper investigates on how to promote the local tourism sector that matches with the changing customer behavior of tourists in ICTs generations. The study shows the ICTs system that is designed for sharing and accessing the points of interest or tourist destination for local tourism and business sector, known as the “Opened Pins Recommendation System”. The results show that there are positive user’s satisfactions of the system design and a prototyping on the tourist users and local tourism sector.

Keywords — E-Tourisms, POIs recommended system, Mobile application

I. INTRODUCTION

The tourism sector is one of the biggest segments in the world: it produces a global value of 11% to the gross domestic product (GDP), creating employment for 200 million people, allocating 700 million tourists worldwide, and will double the rate as the years come along [1]. As Thailand enjoys being part of the world tourist destination the nation’s tourism sector has been its main growth to the GDP [2]. Tourism is also an important part of the economy in northern Thailand. Chiang mai is the center of tourist destination in northern Thailand that is linked to nearby destination comprising of Chiang rai, Phayao, Phare, Nan, Lamphun, Lampang and Maehongson. The groups of northern Thailand provinces are the main tourism route in Thailand. Chiangrai is a famous tourist destination for both local Thais who live close to Chiang Mai and people living overseas. The tourist number during the year 2011 was 2,311,370 people out of 1,680,248 people in 2009, and 2,288,218 people in 2010. The number of tourists is increasing every year and is likely to expand [3]. However, the information related to existing travel management actions is based on various sources that can not be processed in order to support a planning policy for the local government, the local entrepreneur and the visitors. In addition, changes in consumer behavior, media consumption, as well as planning a trip by itself can provide an idea to develop a data center that can collect information for a specific agenda. The analysis of the information can be placed in the data processing storage and displayed to the tourism center for the visitors. The tourism center itself can serves as the connection with the local entrepreneurs and tour operators.

II. PROBLEM DEFINITIONS

The improvements of Information Technology have curiously affected the way that tourism services are implemented in Chiang rai. Certainly, Information and Communication Technologies (ICTs) empower tourists to access consistent and precise information [4]. Internet and mobile device has become the crucial part of the recent information lifestyle; the progress of mobile technologies with multimedia and information technology provide on demand applications and services being utilized in many domain. The domain of tourism mobile applications adapts to the service and/or information which is being offered to the user. The utilities application is represented as the mobile tourist guides. These tourist guides, in most cases, provide two important elements: the first one is finding a way for support and route planning, the second one is the information on points of interest [5]. Some methods of information system try to help users match the touring requirements by point of interests (POI), such as group package tours [6]. Nevertheless, those applications are not deliver some customized direction to tourists or users; instead it accommodates them to determine any potential that are dispossessed of particular to local sites [7]. The changing of technologies and customer behavior are the main point of conscious for the local business sectors in preparing themselves in the adaption for change management. In addition, the large number of tourism information from the internet poses some difficulty for tourists to acquire with inside tourist information from the local market. Also, the local businesses have to match the needs and demand of the tourists who are newcomers with the local market promotion. This study investigates on how to improve the local tourism sector to counterpart with the tourist information digestion behavior with ICTs. The system provides tourism information management system that is represented with geographical information system linking to the tourism service from local entrepreneurs. A social network is published to the traveler by web and mobile system indicating on how to reach the local market with convenience.

III. SYSTEM ARCHITECTURE

A. Model of gathering destination information

A point of interest, or POI, is a specific point location that someone may find useful or interesting. The study defines
POI as the means for tourist attraction sites or destination. Recommended systems provide the direction guide based on users’ searching profiles that is comprised of information classification by places, type, price, rating and distance [8]. In this study, the design is proposed to the POI user with graphical map that is synchronized and open to link with the local business and local tourism stakeholder. The model of gathering destination information is provided in Fig 1.

Fig. 1 Model of gathering destination information

B. Proposed system architecture

The proposed system architecture was derived from an interview with the local tourism stakeholders; they were comprised of local hotel association and restaurant association. The result from the interviews led to the development of the system user requirements which was referred in the first step of The Software Engineering Body of Knowledge (SWEBOK) [9]. The idea focused on how to promote and match the local business with the customers from the internet channel. The local tourism sector is aware with the changing of the new media and technology. They are concerned with how to improve the business process in order to deal with the changing customer behaviors in ICTs generation. The system architecture is revealed in Fig 2.

Fig. 2 Model of gathering destination information

With the local tourism stakeholders linking their own business to the system within the tourism information to create a local POIs, the system will provide the information with the route that is customized by using desktop and mobile web mapping service application (Google maps) for positioning the local POIs.

The information will be stored and classified with the group of tourism information (places, type, prices, rating and distance) to provide details and be represented as the POIs pins for tourist. This concept is demonstrated in Fig 3.

Fig. 3 Drag and drop POIs with mouse scrolling display by using different ways of mouse scrolling

IV. RESULT AND ANALYSIS

A. Opened pins recommendation system

After working on the design phase from Figure 1-3, this study developed a web based maps system to represent the customized POIs recommendation system to the tourists. It comprised of tourist information with local pins or place on map engine that classifies the possible point of interest, in the case of Chiang Rai city, by using web mapping service application and technology that are customized with the open source system from Google maps. The results of this system comprised of three sub-system:

A.1 User Interface

The system is designed with the web based map engine to match the user requirements. The system represents the information that is easy to understand. The display system is shown in Figure 4 with two parts. The first one represents the possibility of POIs with the map pins (number 1). The second one is represented with the search section that makes it possible for the user to search their own POIs by places, type, prices, rating and distance (number 2).
A.2 POIs management system

The POIs management system is designed for supporting the entrepreneur and other tourism stakeholders to manipulate tourism information. This system provides the back office system for the system administrator and accesses grant level for local users who are requesting access with a username and password for manipulating those related tourism information (Figure 5).

A.3 Local Business linkage system

This system provides the local business to promote the tourism products and service by publishing promotion. The system will be automatically linked to the social network application for the promotion or a special discount notification. The tourists can connect with them from checking on site and getting those promotion and discount. This is show in Figure 6.

B. User satisfaction evaluation result

After developing the system, prototyping the system for testing was instigated for proving that it was compatible with the requirements of the users. The evaluation methods were applied with a designed system that tested the configuration of tourist users and local tourism entrepreneurs and then asked them to take part in a questionnaire.

B.1 Tourist user

The results from 30 tourists volunteer gave a positive feedback. The results showed the satisfaction criteria in User friendly, Menu bar, User interface, Functionality, Accuracy, Display results, Recommended for using and Overall Satisfaction. The results showing the positive in level of satisfaction all are good are displayed in table 1.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Level of satisfaction (percentage n = 30)</th>
<th>Average</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. User friendly</td>
<td>Good (5) 48 24 Fair (2) 4 Poor (1) 2</td>
<td>4.04</td>
<td>Good</td>
</tr>
<tr>
<td>2. Reasonable of menu bar</td>
<td>Good (5) 44 4 Fair (2) 4 Poor (1) 2</td>
<td>4.18</td>
<td>Good</td>
</tr>
<tr>
<td>3. User Interface</td>
<td>Good (5) 36 12 Fair (2) 4 Poor (1) 2</td>
<td>4.40</td>
<td>Good</td>
</tr>
<tr>
<td>4. Fully functions for using</td>
<td>Good (5) 36 4 Fair (2) 4 Poor (1) 2</td>
<td>4.56</td>
<td>Good</td>
</tr>
<tr>
<td>5. Accuracy to identify locations</td>
<td>Good (5) 60 12 Fair (2) 4 Poor (1) 2</td>
<td>4.04</td>
<td>Good</td>
</tr>
<tr>
<td>6. Display results</td>
<td>Good (5) 32 8 Fair (2) 4 Poor (1) 2</td>
<td>4.52</td>
<td>Good</td>
</tr>
<tr>
<td>7. Recommended for using</td>
<td>Good (5) 48 20 Fair (2) 4 Poor (1) 2</td>
<td>4.12</td>
<td>Good</td>
</tr>
<tr>
<td>8. Overall Satisfaction</td>
<td>Good (5) 68 4 Fair (2) 4 Poor (1) 2</td>
<td>4.24</td>
<td>Good</td>
</tr>
</tbody>
</table>

B.2 Local Tourism Entrepreneur

In this phase the local tourism sector focused on the local restaurants results. The results were from 10 restaurant mangers in Chiang Rai as users who attempted to use the POIs management and display system and filled out the questionnaire. The satisfaction criteria comprised of User friendly, User interface, Functionality, Accuracy, Display results, Information management, recommended for using the system and overall satisfaction. The results showing the positive in level of satisfaction that are all good is shown in the table 2.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Level of satisfaction (percentage n = 10)</th>
<th>Average</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. User friendly, Easy to propose the business information</td>
<td>Very good (5) 60 20 Fair (2) 4</td>
<td>4.10</td>
<td>Good</td>
</tr>
<tr>
<td>2. User interface</td>
<td>Good (5) 40 - Fair (2) 4 Poor (1) 2</td>
<td>4.09</td>
<td>Good</td>
</tr>
<tr>
<td>3. Functions to promote and link the business to customer</td>
<td>Medium (3) 50 20 Fair (2) 4</td>
<td>4.10</td>
<td>Good</td>
</tr>
<tr>
<td>4. Accuracy to identify locations</td>
<td>Good (5) 80 10 Fair (2) 4 Poor (1) 2</td>
<td>4.08</td>
<td>Good</td>
</tr>
<tr>
<td>5. Display results</td>
<td>Good (5) 30 10 Fair (2) 4 Poor (1) 2</td>
<td>4.50</td>
<td>Good</td>
</tr>
<tr>
<td>6. Information management</td>
<td>Good (5) 30 - Fair (2) 4 Poor (1) 2</td>
<td>4.70</td>
<td>Good</td>
</tr>
<tr>
<td>7. Recommended for using</td>
<td>Good (5) 80 - Fair (2) 4 Poor (1) 2</td>
<td>4.80</td>
<td>Good</td>
</tr>
<tr>
<td>8. Overall Satisfaction</td>
<td>Good (5) 30 10 Fair (2) 4 Poor (1) 2</td>
<td>4.50</td>
<td>Good</td>
</tr>
</tbody>
</table>
B.3 System suggestion from user

Not only was there a valuable quantitative information from the user questionnaire results but it also fulfills the system development with the qualitative information from the user interview and suggestions. The results are classified in two domains. The first one is the System Advantage. The results show that these Systems can support tourism information requirements in terms of being widely supporting and in-depth local information. The system can also be supported as a reference point of interest that can help facilitate the tourist's trip. In addition, the designed POIs system is easy to understand because it positions itself as a user friendly system. Moreover, some users have commented on the system’s limitation by stating that more places of attractions, and sites that provide discounts and promotions should be added as much as possible.

V. DISCUSSION AND CONCLUSION

This study made an investigation for designing a new method for creating an opened system for local POIs recommendation by using the web and mobile map system. The system provides the users or tourists in customizing and simplifying their point of interest with the main routes, in the case of Chiang Rai city, by a time planning condition. This method will deliver the possible places with the tourist requirements for individuals that depend on the trip duration and require each point of interest in detail via local scrolling drag and drop map, provided with description and picture with a real time information on the mobile and web system. Although this study is under a prototyping phase that is limited in terms of local business linkage, it can be fulfilled with a business model linkage between system and local tourism sectors, improving tourist POIS as much as possible with social network system for future work.

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