

Interactive Communication Design to Enhance Tourists' Traveling Experiences in Chiang Rai

Ploypin Chuenterawong

Pages 73 - 92 | Received: November 5, 2018, Received in revised form: December 7, 2018, Accepted: December 17, 2018

ABSTRACT

This study was qualitative- action research, which focused on developing interactive communication tools based upon modern technologies; such as, smartphone and augmented reality (AR) technology for developing an interesting tourism map in order to provide destination information to Thai and foreign tourists who were interested in visiting Chiang Rai and the nearby areas. This was conducted to enhance tourists' travel experiences.

The researcher used a combination of qualitative research and action research in gathering information from stakeholders; such as, tourism policymakers, professionals, representatives of tourism associations and related businesses, as well as, academics and tourists in the local areas. The information was utilized in designing an interactive communication tool to enhance the tourists' experience in order to promote the tourism industry in Chiang Rai.

Four prototypes of the communication tools were developed and were classified in to four frameworks, which were; A Chiang Rai tourist destination map in general; A Chiang Rai map focused on each tourist attraction; A One-day travel map (based on a concept of the slow life journey) and postcards to promote Chiang Rai tourism. The result of tools testing was considered as satisfactory by tourism policymakers, professionals, representatives of tourism associations, related businesses, as well as, tourists in the local areas and these tools should be further developed to use in promoting tourism in Chiang Rai and other provinces in Thailand.

KEYWORDS: communication design, tourism experience design, Chiang Rai tourism

Ploypin Chuenterawong (ploypin.c@chula.ac.th) is a Lecturer at Communication Arts, Chulalongkorn University, Thailand

Introduction

Chiang Rai is a province located in the Upper North of Thailand. Apart from being the northernmost province, Chiang Rai has a lot of resources; such as, agriculture, natural resources, historical heritage, humanism, culture and art, folk crafts including the peaceful and kind living of the people in the society, despite their ethnic diversity. These mentioned aspects have gained interest from both Thai and foreign tourists and encouraged more and more people to visit Chiang Rai each year.

The growth rate of the tourism industry in Chiang Rai has continually expanded due to the aforementioned factors. The main target market is Thai tourists whose numbers have continually and positively increased due to transportation access; for example, the border connection between Thailand and Lao PDR, and close proximity to Southern China, which has resulted in transportation connections by land and river. Moreover, the natural beauty and ethnic mosaic of the local people who have provided warm hospitality have made tourists want to revisit to Chiang Rai.

In addition, the growth of international tourists to this area was a result of the opening of the border crossing points in Chiang Khong and Chiang Saen districts that have enabled tourists to travel to neighboring countries; such as, Myanmar, Lao PDR., and South China by means of land and river transportation.

According to the tourism statistics for the year 2012 (Department of Tourism, Ministry of Tourism and Sports, 2013) Chiang Rai obtained 18.18 billion Baht from the tourism industry. Of this total amount, 14.03 billion Baht came from Thai tourists (75%), and 4.78 billion Baht was generated from international tourists (25%).

A total of 2.75 million visitors came to Chiang Rai. Among these 2.23 million (81%) were Thai tourists while 0.52 million (19%) were international visitors. With regards to the Thai visitors, 1.94 million were tourists (87%) while 0.29 million (13%) were excursionists, traveler who stays less than a full day (24-hours) in a country. As for international visitors, 0.46 million of them were tourists (88%) while 0.06 million (12%) were excursionists.

The tourists' expense in 2012 can be classified by the types of visitors; such as, Thai excursionists spent 1,857 Baht/person/day while Thai tourists spent 2,627 Baht/person/day, during their visit to Chiang Rai. International excursionists also spent 1,857 Baht/person/day while international tourists spent 3,226 Baht/person/day (Department of Tourism, Ministry of Tourism and Sports, 2013).

Nowadays, advanced technology, especially digital technology, has an increasingly important role in making people's lifestyle significantly, different from the past. This includes changes in work, education, business, as well as traveling. Moreover, the new generation tend to search for and trust information from electronic resources through smart devices. Therefore, the development of techniques and communication tools are important in attracting and creating

experiences for the target group, who are interested in a variety of tourism products and services.

Therefore, in developing a policy, planning, and managing tourism to be successful requires systematic communication with the visitors. This system should be easy to access and provide continual information that makes visitors feel convenient. Furthermore, it should be appropriate for the new lifestyles of the tourists in the digital era. However, the current promotional communication of Chiang Rai has been operated by government offices through the traditional approaches; such as, website, poster, and leaflet, which are unattractive, out of date and cannot reach all target groups. Therefore, the implementation of new technology would improve the public relations efforts, to better enhance greater efficiency and generate more interest.

The objectives of this study were to create guidelines for the new design of communication channels, which would be appropriate for tourists visiting Chiang Rai through a smartphone by means of interactive communication based upon augmented reality (AR) technology. This was conducted in order to provide tourists with interesting, up-to-date, easily accessible information, as well as help reduce the amount of indirect carbon emissions caused by the use of paper. Therefore, the result of this research would assist in developing Chiang Rai's tourism public relations communication to be more appropriate, environmentally-friendly, and more efficient in the future.

Research Objective

This study was a qualitative-action research, which aimed to develop and test interactive communication tools based upon augmented reality (AR) technology, in order to create a new tourism experience for tourists visiting Chiang Rai.

Concept, Theory and Research

This study utilized an integrated research technique, new technology and knowledge to build and test a tool for interactive communication for tourists in Chiang Rai. This required using a variety of topics, theories and important research, as follows: 1) Creative Tourism 2) Marketing Communication 3) Augmented Reality (AR) and 4) Research on Tourism in Chiang Rai.

1. Creative Tourism

Creative Tourism is a form of tourism that is consistent with sustainable community development by organizing activities that are consistent and relevant to cultural history as well as learning the way of life in the community. The United Nations World Tourism Organization (UNWTO, 2013) has categorized this form of tourism into three types:

1.1 Natural Based Tourism

This tourism style more relates to the nature including ecotourism, marine ecotourism, geo-tourism, agro tourism, and astronomical tourism.

1.2 Cultural Based Tourism

Cultural based tourism connects to the historical tourism, rural tourism/village tourism which is about arts, handcraft, festivals and local celebrations.

1.3 Special Interest Tourism

The tourists focus more their own interests such as health tourism, edu-meditation tourism, ethnic tourism, sport tourism, Adventure Travel, home stay & farm stay, long stay, incentive travel, or participating in conferences.

2. Marketing Communications

Marketing communications are an important tool that helps consumers receive information, marketing and brand communication efficiently.

Marketing communications will integrate a wide variety of marketing channels to consistently communicate about the organization and product (Kotler & Armstrong, 1999). Communication is the sharing of the meaning of a person by means of a common symbol, a medium for expressing feelings, ideas, facts and attitudes to communicate (Lamb, Hair, & McDaniel, 2011).

Choompolsatien (2011:20-33) described the characteristics of marketing communication.

1. Persuasion and Information.
2. Sales Objective.
3. Contact Point.
4. Stakeholders.
5. Marketing Communication Message.

Nowadays, in the era of high marketing competition, marketers use online communication as a marketing tool because it can reach the target audience faster and affect the recognition and decision to accept it quickly. Hence, at present, mobile phones have been used to connect to the Internet that has resulted in the disruption of traditional forms of communication (Siripanlapa, 2004)

3. Augmented Reality

Augmented Reality Technology (AR) is a sub class of Virtual Environment (VE). AR helps stimulating a real-world environment into a virtual environment making the users feel out of the real environment by perceiving through visual, auditory, haptic, somatosensory and

olfactory. The AR uses computer to generate virtual objects as photos, video clips, audio or data to be combined with a real-world environment at that moment (Kipper, Greg, Rampolla, & Joseph, 2012).

Azuma (1997) states that AR is a kind of interactive technology which is a form of technology that operates between the real environment and the virtual object in real time. Additional technology includes three features which are 1) technology that is a combination of real and virtual objects, 2) ability to respond to immediate perception, and 3) rendered in 3D, which is consistent with Borrero and Marquez (2012). Yuen, Yaoyuneyong, and Johnson (2011) added that extra technology is a form of automation that allows a computer to process and compile text, video, images, and objects in both 2D and 3D to present to the user with integrated processing into the real environment.

For Thailand, many academics have provided various definitions of AR technology. Tansiri (2010) stated that AR technology brings the reality as it is to be integrated with automation to create virtual objects. This may be in the form of a 3D model or video, and may be rendered by means of an electronic device; such as, a tablet or a mobile phone.

Klinnhoo (2013) mentioned that AR technology is a hybrid of virtual reality technology with camera technology from mobile devices; such as, mobile phones, webcams, or computer cameras included with the software, multimedia, video, and audio to display the surrounding visual or 360-degree visuals in real-world environments. The symbol used in AR is the main element in the selection of the objects.

In addition, Smithlitha (2016) added that AR technology provides a real-world view of the real-world mix of material objects by giving the recipient a more exhilarated perception and experience.

From the above definitions, it can be concluded that AR refers to technology that brings together virtual objects, whether they are 2D or 3D objects, video, or audio to be overlaid with images with images captured on the spot. In addition, the video can be displayed on the screen of the electronic device, mobile phone, or webcam in which the user can immediately interact with the data displayed.

The Working Process of AR

The main concept of augmented reality (AR) is the factual reinforcement. The technologies are developed to be integrated with the real world and utilize virtualization through software as well as connectors because the image is displayed on the computer screen, mobile phone's screen, on a projector, or on other display devices. They can interact with the user immediately as a 3D object, animation or maybe media with audio. This depends on the design of each form of media that is produced. There are three internal processes of AR technology (Azuma, 1997):

1) Image analysis is the process of creating a picture database or the marker by converting the image data from a video camera to be a digital image. Image analysis can be divided into two types, which are marker-based AR and markerless based AR.

2) Pose estimation is the process of calculating the 3D value of the matrix to obtain the relationship between the camera coordinates captured in accordance with the coordinates of the image or symbol contained in the database.

3) 3D rendering process from a 2D model that is to add information to the image by using a 3D position calculated to become virtual reality and is displayed on the coordinates derived from the three-dimensional position of the marker.

The core of AR is the integration of motion detection, beat detection, voice recognition, and image processing. In addition to motion detection, some of the responses of the system through the media must be monitored, capture the user's voice and be processed to provide a rhythm to create the right choice for the system; such as, the voice command to interact with the media. Voice commands are complementary technologies and, in the case of image processing, are the workings of artificial intelligence (AI) to convey emotions to users through media and images.

Furthermore, Anukulwech and Buabangploo (2013) explained AR technology working system as 4 parts which are 1) AR marker marking the perspective and positioning the virtual object on computer. 2) Webcam is a device capturing the position of the required image for processing. 3) Computers programmed the ability to analyze the position for picture display by choosing the indicated virtual object in the correct position. 4) The display monitor shows the real time environment and the indicated virtual object to the users.

Types of Augmented Reality Technology

Kumar (2016) allocated 2 types of AR technology

- 1) **Marker-based AR** -This technology uses the pictures, marks or QR code which is the most popular in practice because of the convenience both for users and creating information. A marker is reflected through the webcam camera, where the logotype can be created manually, whether JPEG, GIF or PNG can be created to stick to the object you want to pass through. When the webcam camera captures the required marker, the program will display a graphic or video on the area through electronic devices screens.
- 2) **Location-based AR technology** -The technology uses mobile phone or tablets through a Global Positioning System (GPS) located on the devices, which could be connected to the internet using Edge, 4G or Wi-Fi. After that the application will send digital information through the real-world environment, displaying as video or sounds depending on the direction and position of the device.

The application of AR

From past to present, AR has been developed to enhance the practicality of everyday life so that it has become an innovation that has changed the way of life and consumer communication. This can be seen from examples; such as, industrial applications, the aviation industry or automotive manufacturing industry. BMW uses AR technology to assist in its production by letting users learn to work together by putting on headsets that will guide them, and the simulation shows each step before the actual 3D model.

Medical applications by adding a 3D touch interface to enhance the realism of the treatment also allows medical students to use medical instruments. Ganz College has created an AR virtual liver surgery simulator using connectors, and it constitutes the creation of information that is a component of the virtual world; such as, graphics, videos, 3D shapes and text, to coordinate with the visuals that appear on the camera (Gaudiosi, 2016).

For applications in business; such as, financial trading with technology called CYBERII, the system allows users to define their roles as a finance dealer in an AR virtual environment that can bid for the trade (Maad, Grabaya, & Bouakaz, 2008).

For advertisements, companies like IKEA have created an application that can be viewed by customers before making a purchase to see how the furniture will be placed in any area of the house and whether or not it will fit into a room or other locations that the customer chooses (Dasey, 2017). Tissot, the watch manufacturer from Switzerland in collaboration with Harrods, a British department store, allows customers to experiment with virtual watches on a display screen in the department store. Customers can choose the code or the model they want to test, and the customers can experiment with a variety of products to know the product before making a purchase (Luxuo, 2011).

Moreover, it can be used in the media industry. In the list of television programs, it will have content that supports AR technology, so the viewers can see the 3D viewer and engage interactively with any part of the content; such as, a game show where viewers can participate in the game through a smartphone, see weather forecasts displaying weather information in an animated 3D format, or watch sports shows that take pictures in the TV studio, etc (Balderston, 2017).

The use of AR has also been utilized in tourism; such as, the Dusit Zoo in Bangkok, Thailand. There are signs for animals in the Zoo, and when visitors download the application and use two cameras on the animal's tag, information about that animal is displayed in a video, audio, and text (AppAdvice, 2016).

4. Research related to Tourism in Chiang Rai

From the results of the study on tourism in Chiang Rai, it was found that foreign tourists were satisfied with the high level of accommodation in this province. They provided the opinion that most accommodation has a good standard of comfort; such as, price, safety and facilities. It was found that most tourists wanted to return to their previous accommodation (Lohachala, 2002), which was consistent with the use of tour guides in Chiang Rai. Tourists were satisfied that the guide had good academic, tourism and management knowledge, and displayed human relations and kindness (Duangsanit, 2002).

Kumsaen and Roengsiri (2007) studied the behavior of tourists in Chiang Rai province. The most impressive place was Phrathat Doi Tung - Phra Tamnak Doi Tung. Most tourists chose hotel accommodation for a two-night stay, and were likely to use the services of most local restaurants and souvenir shops. Tourists also decided to travel to Chiang Rai because it has

good weather. They mainly received information from travel magazines, and secondly news from the Internet. Additionally, tourists wanted the convenience of traveling with accessible transportation in Chiang Rai.

From the study, these factors affecting traveling in Thailand were obtained from the foreign target markets of Australia, China, Germany, Japan, Malaysia, Singapore, South Korea, Taiwan, the United Kingdom, and the USA, respectively.

It was found that the first aspect regarding the changing of the currency of each country affected the number of arrivals to Thailand. Other factors; such as, costs affecting the number of foreign tourists, and income from tourism had a relationship with the number of foreign tourists (Boonmaruen, 2003).

Research Methodology

This study was a qualitative research using participatory action research methodology that had been screened through various stages. From the information gathered about the tourism of Chiang Rai province, the data provided by the group was the basis for creating the design of the interactive communication to enhance the experience of the tourists. Moreover, all information was accessed by designing attractive tourist maps and using new technologies, both communication formats and AR technology for interactive design by means of the tourists' smartphone, both in Thailand and abroad under the following steps:

1) Documentation, observation and data analysis procedures.

1.1 Information from academic journals, articles related to tourism in Chiang Rai, social media, human behavior and new generation consumers were collected using the method of gathering, analyzing data and compiling summaries from reliable sources for further study.

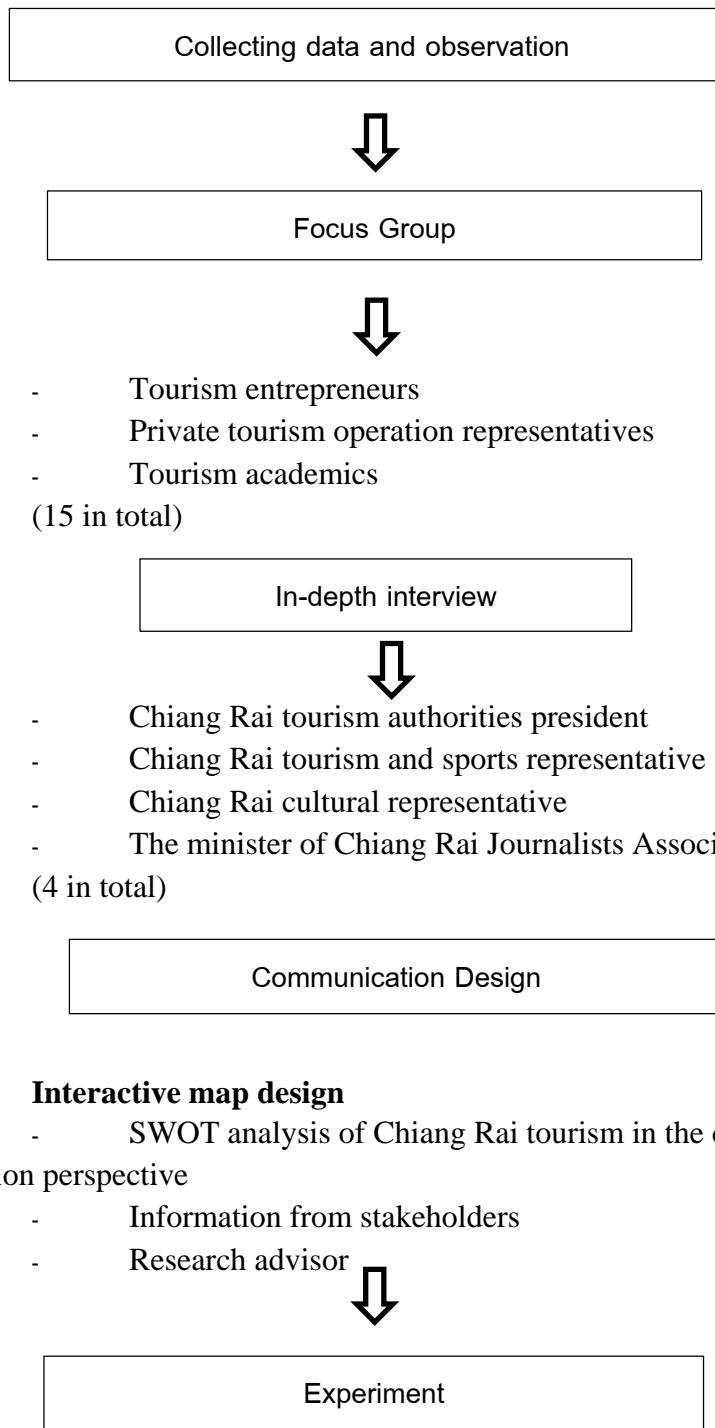
1.2 Information gathered from focus groups brainstorming from total 15 tourism policy and promotion authorities, tourism scholars, representatives of tourism operators, including with private tour operators in Chiang Rai.

1.3 Information gathered from in-depth interviews with policy authorities and individuals who play a role in Chiang Rai tourism including tourism and sports in Chiang Rai province, Tourism Authority of Thailand (TAT), Chiang Rai province, Chiang Rai and the president of the Chiang Rai Journalists Association, totaling four people.

Process of the Design and Experiment

The design and testing process is an important step in this research. The researcher designed the prototype tool and tested the tool developed from data previous collected to test and apply for completion in order to be used as a designed tool for Chiang Rai tourist interactive information communication as mentioned in the purpose of this research.

Action Research



Interactive map design

- SWOT analysis of Chiang Rai tourism in the communication and public relation perspective
- Information from stakeholders
- Research advisor

Researcher's scope

- Chiang Rai tourist destination map in general
- Chiang Rai map focused on each tourist attraction
- One-day travel map (based on a concept of the slow life journey)
- Postcards of Chiang Rai.

Research Findings

The researcher studied tourist information from related documents, academic articles, concepts and theories including tourist information of Chiang Rai. The data was analyzed and summed up from reliable sources including exploring various areas, tourist attractions, observations and general inquiries from people in the community. The data was then summarized, as the basis for further study.

Step to Organize Focus Group Meetings

The researcher organized a focus group meeting to brainstorm opinions of 15 people involved in Chiang Rai's tourism which consisted a group of tourism industry academics, leaders of private tourism organizations, tour companies, middle-class hotels, souvenir shops, restaurants, tour guides, tour operators, and air ticketing businesses.

The results of this focus group were used as a guideline for in-depth interviews with Chiang Rai's tourism policymakers to obtain suggestions and to develop tourism in Chiang Rai.

Table 1 Number of participants in the focus group.

Focus Group Meeting	No. of Participants
1. Tourism industry academics	5
2. Chiang Rai Provincial Tourist and Sports Office	3
3. Tourism business groups in Chiang Rai	7
Total	15

From the conclusion of the brainstorming session on the concept of tourism development in Chiang Rai, the focus group could be summarized as follows:

Factor 1 Should include the development of new and more attractive tourist attractions as well as additional activities to enhance tourism to attract both Thai and foreign tourists, emphasizing on public relations to reach different groups.

(Frequency = 15)

Factor 2 The emphasis should be on promoting cultural heritage and the Lanna traditions as the highlight to attract tourism in Chiang Rai. This would also focus on continuous cultural activities associated throughout the year by collaborating with the community to cooperate and promote participation of tourists.

(Frequency = 15)

Factor 3 Food and restaurants must be used as a selling point to attract tourists; such as, traditional food, various hill tribes' food, and general food to encourage the community to participate; such as, food festivals, health development, non-toxic food or the use of safe

ingredients in the cooking area. There should be public relations, restaurants, and interesting accommodation.

(Frequency = 14)

Factor 4 There should be public relations representatives of the city of Chiang Rai distributed in many districts. The tourists lacked information because it could not be accessed, visited and experimented by the government and non-governmental organizations. It should be the mainstay of the operation, promotion and communication.

(Frequency = 14)

Factor 5 There should be more easy-going activities in the city for tourists; such as, cycling, walking, taking a tricycle, free tram, special area management, and sports activities. For the already existing activities, these should be published to tourists to acknowledge and participate in thoroughly.

(Frequency = 14)

Factor 6 It is recommended that there should be three areas that are considered to have tourism potential, but there are still many improvements and a lack of appropriate activities; such as, 1. Doi Khao Khwai; 2. Suan Tung, and 3. along the Kok River.

(Frequency = 13)

Factor 7 Language used for public relations and promotions should be developed in simple English and Chinese to communicate with foreign tourists. This would be beneficial for groups; such as. Taxi, tricycle, restaurant, souvenir shop, rafting, elephant camp, as well as national parks, museums, etc.

(Frequency = 13)

It is evident that most of the information presented is related to the development of new tourist attractions to create tourist-related activities to attract visitors as well as to cooperate with the community to provide tourist services, to meet a satisfactory experience. This would focus on the importance of public relations and communication to tourists in all activities to make the information clear, accurate, modern, attractive and accessible to them. As a consequence, the visitors would learn about all the tourist activities in Chiang Rai and could participate in activities; such as, the tourism management of Chiang Rai.

In-Depth Interview

The researcher gathered information from the brainstorming meeting and explored the field to be used as a guideline for in-depth interviews from Chiang Rai's tourism industry's stakeholders. There are four direct tourism planning and management organizations in Chiang Rai.

1. Chiang Rai Provincial Tourism and Sports Office
2. Tourism Authority of Thailand (TAT) Chiang Rai Office
3. Chiang Rai Cultural Office

4. Chiang Rai journalist association minister

In-Depth Interview Summary from Tourism Authorities in Chiang Rai

1) Chiang Rai is a province that has tourism resources, and appealing geography, climate, culture and society, so it has tourism potential and can generate the main income from this industry. Additionally, it is an important policy to continuously develop tourism in Chiang Rai, so the province is prepared for travel in various aspects.

- It is an economic gateway linking with the neighboring countries of Myanmar, Lao PDR. and Southern China, so both Thai and foreign tourists can travel through this route.

- Chiang Rai has the right climate and terrain as well as the infrastructure and facilities of an international airport, pier, network, roads and railways. Therefore, it is convenient to travel for tourism and can be linked to the Greater Mekong Sub-region on routes R3A and R3B.

- Chiang Rai has many interesting attractions. There are 58 natural attractions, 46 historical sites, 17 cultural and historical sites, 30 hill tribes, and more than 100 artists.

2) Chiang Rai has a long tradition of over 700 years of Lanna culture, as well as a mix of harmonious ethnic diversity and lifestyle, beliefs and traditions, that emphasize the promotion of cultural tourism in order to attract tourists. Currently, there is cooperation to preserve the homeland of the Lanna artists of Chiang Rai, and the promotion of art in all aspects; such as, the restoration of the old art of Lanna temples, the opening house by 13 artists to display their art to tourists, archeological sites, history of Chiang Saen, Wiang Kalong, Wiang Nong Lom, people of the city, etc.

3) Currently, Chiang Rai has a major policy to promote and develop tourism to access new forms of tourism and to develop the convenience of traveling into the tourist areas, as well as cooperate with the community in the conservation and improvement of tourist areas including the provision of tourist services in various areas.

Many educational institutions and scholars in Chiang Rai have contributed to research related to tourism promotion in Chiang Rai. Training are also provided to develop the potential of tourism operators and tourism related people in Chiang Rai.

The four key respondents provided more consistent feedback on the success of the focus to disseminate tourist information and services. At present, the province has been trying to develop and find new ways to communicate tourism more effectively by focusing on the target group more effectively by using modern technology, to comply with the current tourists' information access behavior.

Such concepts and requirements were consistent with this study and the set objectives, so the result of the communication design in this research would be responsive and used to develop communication to promote and provide information on quality tourism in Chiang Rai.

Interactive Communication Design and Testing Communication Design Procedures

The goal of this design was to develop a communication model of tourist information to reach tourists visiting Chiang Rai, with an emphasis on attracting both Thai and foreign tourists. In addition, it was suitable for the current tourist information perception through smartphones that supported augmented reality technology or AR.

The researcher designed a new Chiang Rai map to make it simple and more interesting for the new generation of tourists, by using modern technology. Furthermore, the tourist information channels were more convenient to read the tourist information, and the tourists could use smartphones, which was related to their interactive nature.

The research was carried out by collecting data and research related to Chiang Rai's tourism including information about interactive media on AR to provide the basis for the new Chiang Rai tourist map design.

After that, the researcher collected data from the focus group meetings of Chiang Rai's tourism stakeholders as well as data from in- depth interviews with Chiang Rai tourism policy administrators and analyzed the data by linking the objectives. Moreover, the main themes of the research, through its concept and related theories, were to create a communication design for the Chiang Rai tourism experience. The prototype was divided into four conceptual frameworks as follows:

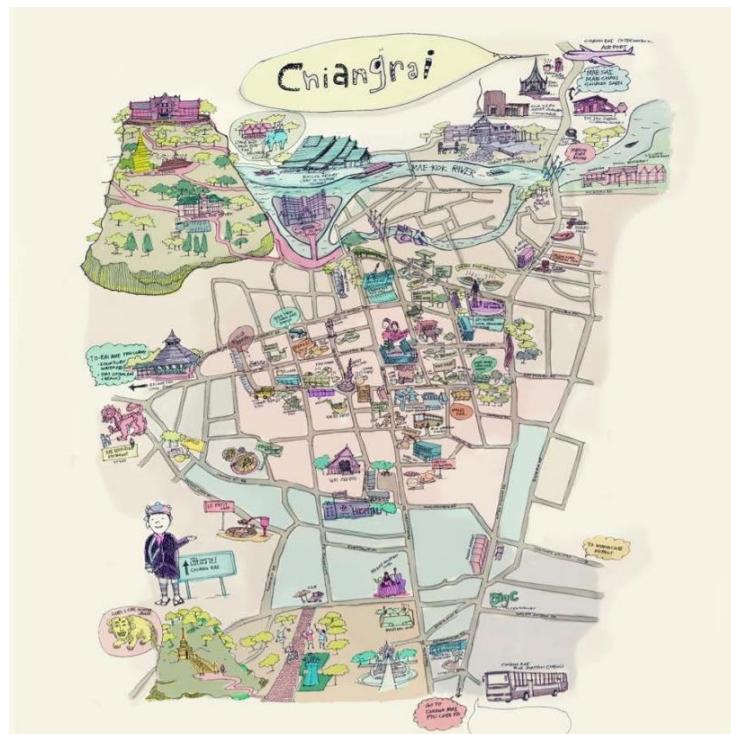
Concept 1 Overall travel map of Chiang Rai.

Concept 2 Tourist map in a specific area of Chiang Rai.

Concept 3 Travel map for a One-Day trip for a "Slow Life Journey".

Concept 4 Postcard image of Chiang Rai (for tourists to deliver to other tourists for public relations through postcards).

Concept 1 New Design of overall travel map of Chiang Rai



Concept 2 New Design of tourist map in a specific area of Chiang Rai



Concept 3 Travel map designed for a one' Day trip plan for a “Slow Life Journey”.



Concept 4 Interactive postcard of Chiang Rai tourist spots for tourists to deliver to other tourists for public relations through postcards.



The researcher created the prototype by re-designed the traditional map and used visual compositions to communicate idea through illustration to attract more tourists and enhance tourists' travelling experience by connecting with Augment Reality Technology application called "Layar". The researcher used the Marker-based AR which the pictures of the maps are created to stick to the real maps. When the camera captures the real map, the application will display an animation and websites on the area through electronic device screens.

Prototype Interactive map design



Design Testing Procedure

The researcher has designed the four concepts in order to have the design evaluated by two design experts and two interactive media design experts. The four concepts have been well-evaluated and satisfied in the field of map design, interesting, accurate information, and able to provide interactive information monitored by the goals

In addition, the researcher brought the designed work for stakeholders' opinion, for trial usage. These groups included both Thai and foreign tourists visiting Chiang Rai, focus group and Depth-Interview participants as well as tour operators in a total of 25 people. The results of the experiment were found to be acceptable and satisfactory in this tool trial usage. This study was able to conclude and confirm that the design of the interactive communication to create this Chiang Rai tourist experience was beneficial. It facilitated and enabled visitors to access the tourist information as needed, as well as helped them to plan their own travel by means of the travel information through this design tool.

Conclusion

This study was conducted to develop an interactive communication prototype by using a travel map with a smartphone and augmented reality (AR) technology to promote tourism in Chiang Rai, using quality research in the form of action research to create and test tools in the form of a map design. The participants comprised both Thai and foreign tourists. The researcher collected the data from the qualitative gathering for analysis by linking the objectives, concepts and theories related to the creation of the communication design for the tourism promotion of Chiang Rai. The design of the prototype was based on an interactive Chiang Rai tourist map, which was used in conjunction with a smartphone. The prototype was divided into four conceptual frameworks as follows:

- 1) Overall travel map of Chiang Rai.
- 2) Tourist map in a specific area of Chiang Rai.
- 3) Travel map for a one-day trip for a "Slow Life Journey".
- 4) Postcard image of Chiang Rai (for tourists to deliver to other tourists for public relations through postcards).

The researcher then applied all the designed work to be evaluated by two design experts and two interactive media design experts on the design and tested with the stakeholders such as, both Thai and foreign tourists, tourism operators in Chiang Rai, tourism industry academics, and tourism policymakers in Chiang Rai. The result of the design evaluation and experimental evaluation of the tool were accepted and meet all desired goals and requirement in term of efficiency and overall design. As such, this confirmed the success of the research that the interactive communication design to enhance tourists traveling could be used as a tool to promote communication and promote tourism in Chiang Rai under the purpose of the research. Moreover, this would be beneficial for promoting tourism in Chiang Rai or other areas if it was supported and driven by the government and other stakeholders.

References

Anukulwech, A., & Buabangploo, P. (2013). The production of augmented reality media through augmented reality technology in smart phone and tablet with aurasma program. Retrieved September 2, 2018, from http://www.uni.net.th/register.../0_0_5_BuildAR_2013_1.pdf.

AppAdvice. (2016, December 4). *Bedo Dusit Zoo*. Retrieved September 2, 2018, from <https://appadvice.com/app/bedo-dusit-zoo/1166072421>

Azuma, R. T. (1997). A survey of augmented reality. *Presence: Teleoperators & virtual environments*. 6(4), 355-384.

Behance. *Showcase & discover creative work*. Retrieved July 6, 2018, from <https://www.behance.net>

Borrero, A. M., & Marquez, J. M. A. (2012). A pilot study of the effectiveness of augmented reality to enhance the use of remote labs in electrical engineering education. *Journal of Science Education and Technology*. 21(5), 540-557.

Kositpipat, C. (2012). *Watrongkhun Chiang Rai*. Retrieved September 2, 2013, from <http://www.watrongkhun.org/>

Kumsaen, C., & Roengsiri, S. (2007). *Tourists' travelling behavior in Chiang Rai*. Master's thesis, Chiang Rai Rajabhat University, Chiang Rai.

Chavouet, F. (2011). *Tokyo on Foot: Travels in the city's most colorful neighborhoods*. Tokyo: Tuttle Pub.

Chiangrai Statistical Office. (2013). *Development plan for Chiangrai year 2010-2013*. Retrieved September 2, 2013, from http://chiangrai.nso.go.th/chrai54/plancr2553_2556.pdf

Chiangraifocus. (2007). *Online society for Chiangrai*. Retrieved September 2, 2013, from <http://www.chiangraifocus.com/>

Dasey, D. (2017). *Try before you buy*. Retrieved September 2, 2018, from <https://highlights.ikea.com/2017/ikea-place/>

Department of Tourism. (2011). *Summary of tourist situation. 2005-2010*. Retrieved September 2, 2013, from <http://www.tourism.go.th>

Folktravel. (2013). *Data travel of Chiangrai*. Retrieved September 2, 2013, from <http://www.folktravel.com/archive/chiangrai.html>

Gaudiosi, J. (2016, August 28). *Doctors using VR to aid in neurosurgery is a no-brainer*. Retrieved September 2, 2018, from <http://uploadvr.com/surgical-theater-neurosurgeons/>

Sathapornwachana, J., & Muangsun, S. (2013). The design and development of textbook with augmented reality technology of 3 dimensions on illustration. Bangkok: Rajamangala University of Technology Rattanakosin.

Klinnhoo, J. (2013). *The application of artificial intelligence technology in creating electronic lesson and learning activities concerning security of information technology to enhance academic achievement of information and technology course*. Retrieved September 6, 2018, from <http://oer.thaicyberu.go.th/handle/6626105234/847>

Boonmaruen, K. (2003). *Factors Affecting International Tourist Travels*. Unpublished Master's thesis, Chiang Mai University, Chiang Mai.

Kipper, G., & Rampolla, J. (2012). *Augmented reality: An emerging technologies guide to AR*. Boston: Syngress.

Siripullop, K. (2004). *Value creation of online brand*. Retrieve September 2, 2013, from <http://www/bus.tu.ac.Th/usr/kitti/brand.doc>

Kotler, P. & Armslrong, G. (2006). *Principles of Marketing* (11st ed.). New Jersey: Prentice Hall.

Kumar, S. (2016). *7 Amazing facts about augmented reality: Your tech world*. Retrieved September 6, 2018, from <http://www.augrealitypedia.com/7-amazing-facts-augmented-reality-tech/>

Luxuo. (2011, April 7). *Tissot augmented reality window at harrods*. Retrieved September 2, 2018, from <http://www.luxuo.com/style/watches/tissot-augmented-reality-window-display-harrods.html>

Lamb, C. W., & Joseph, F. (2001). Hair and Carl Mc Daniel. *Essentials of Marketing*. Australis: South-Western College Pub.

Layer. (2012). *Easily create your own interactive augmented reality experiences*. Retrieved September 4, 2018, from <http://layer.com>

Balderston, M. (2017, December 7). *We Are TV Uses AR To Evolve TV Experience*. Retrieved September 2, 2018, from <https://www.tvtechnology.com/news/we-are-tv-uses-ar-to-evolve-tv-experience>

Gardner, N. (2009). *Slow travel Europe making conscious choices*. Retrieved September 2, 2018, from <http://www.slowtraveurope.eu/slow-travel-manifesto>

One Fed Day. (2009). *A whimsical personal touch-cute maps*. Retrieved October 12, 2013, from <https://www.onefabday.com/cute-maps-wedding-stationery/>

Tansiri, P. (2010). Augmented reality. *Executive Journal*, 30(2), 169-175.

Duangsananit, P. (2002). *Foreign tourists' opinions towards the services of tourist guides in Chiang Rai province*. Unpublished Master's thesis, Chiang Mai University, Chiang Mai.

Pinterest. (2009). Belle amour less of the traditional & more of the original. Retrieved September 3, 2018, from <https://www.pinterest.com/pin/533465518337594809/>

Postcard TW-437349. (2009). *Postcrossing*. Retrieved September 2, 2018, from <http://postcrossing.com/postcards/TW-43734>

Choompolsathean, P. (2001). *Strategic Marketing Communication*. Bangkok: SE-ED Education. PCl.

Dachum, P. (2009). Creative tourism development: From concepts to practice for Thailand. *Silpakorn University Journal*, 33(2), 329-364.

Maad, S., Grabaya, S., & Bouakaz, S. (2008). From virtual to augmented reality in financial trading: A CYBERII application. *Journal of Enterprise Information Management*, 21(1), 71-80.

Kumar, S. (2016). *How does an augmented reality application work?* Retrieved September 2, 2018, from <http://www.quora.com/How-does-an-augmented-reality-application-work>

UNWTO. (2013). *Why Tourism?* Retrieved October 5, 2013, from <http://www2.unwto.org/content/why-tourism>

Smithlitha, V. (2016). *What is Augmented Reality (AR)*. Retrieved September 2, 2018, from https://broadcast.nbtc.go.th/bcj/2559/doc/2559_10_4.pdf

Lohachala, W. (2002). *Oversea Tourist Satisfaction with the Selection of Accomodations in Chiang Rai Province*. Unpublished Master's Thesis, Chiang Mai University, Chiang Mai.

Yuen, S., Yaoyuneyong, G., & Johnson, E. (2011). Augmented reality: An overview and five directions for AR in education. *Journal of Educational Technology Development and Exchange*, 4(1), 119-140.