Web Information System for Promoting Cultural Tourism in The Old Moat of Nakhonratchasima City Municipality

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Abstract

The conservation and promotion of tourism, arts and culture resources is a goal of development plan of Nakhonratchasima City Municipality (NCM) year 2018-2021. Therefore, this article requires designing and developing web information system-based System Development Life Cycle (SDLC) for promoting cultural tourism in the old moat of NCM. Scope of study focuses on the linked routed between Thao Suranaree Monument and 6 old temples (Bueng, Sakaeo, Bon, E-San, Phra Narai Maharat, and Phayap). In this study, SDLC methodology for web development includes five steps: data collecting and analysis, plan and requirements, design and development, testing and deployment, and maintenance. Moreover, this web information system are evaluated by 2 groups: (1) group of 6-expert for content and system design and development and (2) group of 394-user for evaluating acceptance of this web technology (5 officers of section tourism promotion from office of NCM and 389 visitors). As results, this study divided into 3 parts. The first part presented information of Thao Suranaree monument and 6 temples with activities, time and routes' access. The second part showed output of web design and development through evaluation of 6 experts (good level with mean 4.12 (S.D. 0.21). The third part explored acceptance evaluation of this web from 5 officers of NCM and 389 visitors who accepted this web in high level with mean 3.94 (S.D. 0.43) and mean 3.41 (S.D. 0.32), respectively. Consequently, the web information system-based cultural tourism from this study can be used for promoting cultural tourism in the old moat of NCM.

Keywords: web information system, cultural tourism, system development life cycle

1. Introduction

According to one goal of development plan of Nakhonratchasima City Municipality (NCM) year 2018-2022, there is conservation and promoting of tourism, arts and culture resources. This goal is in the line of the 20-year national strategy year 2018-2037 and the tourism development strategy year 2018-2021 of the Department of Tourism. In NCM, there is the old moat where includes Thao Suranaree monument and 6 old temples (Bueng, Sakaeo, Bon, E-San, Phra Narai Maharat, and Phayap). These places should be promoted as cultural tourism.

Therefore, this study aims to design and develop web information system for promoting cultural tourism in the old moat of NCM. Scope of this study focuses on Thao Suranaree monument and such 6 old temples. This study required web development in accordance with Poltanee & Boonphetkaew (2019) mentioned that situation and trend of tourists' behavior both Thai and foreign about using internet to book the rest or hotel and to visit web for making decision. This report relates to Thailand 4.0.

2. Literature review

2.1 Cultural tourism

There are many definitions of cultural tourism. For example of recently sources, according to the United Nations World Tourism Organization (UNWTO) (2017) and Division of Cultural Affairs (2020), cultural tourism is defined as "movements of persons for essentially cultural motivations such as study tours, performing arts and cultural tours, travel to festivals and other cultural events, visits to sites and monuments, travel to study nature, folklore or art, and pilgrimages". Alexova (2020) describes the definition and development of cultural tourism is a form of specialized cognitive tourism that focuses on tangible or intangible cultural heritage. In addition, Gomez (2020) explains the cultural tourism is one of the main local economic foundations. Santos et al. (2020) define more details of the cultural tourism that is tangible and intangible aspects of the culture of a certain tourist destination, closely linked to the local community, heritage, history, architecture, traditions, arts and crafts, gastronomy, painting, dance, and music, social practices, rituals, festive events, which are factors of identify and preserve authenticity. There are research and academic papers relevant to cultural tourism in areas such as Sukanasirikun (2016), Boonsomkiat (2012) and Kitcharoenpalisal (2010). However, these mentioned papers are not still having web development-information system for cultural tourism.

The application of web information system with the System Development Life Cycle (SDLC) is a tool to promote efficiency in terms of time and cost for tourism. Agustina and Ariani (2017) and Venkatesh et al. (2003; 2012) presented that the design of Geographical Information Systems (GIS) with SDLC method is very convenient in its application through web-based information for tourism. There are many studies relevant to cultural tourism in Thailand such as Sukanasirikun (2016), Boonsomkiat (2012) and Kitcharoenpalisal (2010), however these studies have not presented in using web development-information system for cultural tourism.

Thus, this study requires designing and developing web information system-based System Development Life Cycle (SDLC) for promoting cultural tourism in the old moat of NCM. Guideline of SDLC concept and methodology is reviewed in topic 2.2 to be used for web development further.

2.2 Design and development of web information system

This article concentrated on literature review of designing and development of web information system based on SDLC. We collected papers about using SDLC methodology for developing web information system i.e. Evans (2019), Rouse (2009) etc. In general, a SDLC methodology follows these following steps (Evans, 2019; Rouse, 2009):

1) Analysis: the existing system is evaluated. Deficiencies are identified. This can be done by interviewing users of the system and consulting with support personnel.

2) Plan and requirements: the new system requirements are defined. In particular, the deficiencies in the existing system must be addressed with specific proposals for improvement. Other factors defined include needed features, functions and capabilities.

3) Design: the proposed system is designed, Plans are laid out concerning the physical construction, hardware, operating systems, programming, communications and security issues.

4) Development: the new system is developed. The new components and programs must be obtained and installed. Users of the system must be trained in its use.

5) Testing: all aspects of performance must be tested. If necessary, adjustments must be made at this stage. Tests performed by quality assurance (A) trams may include systems integration and system testing.

6) Deployment: the system is incorporated in a production environment. This can be done in various ways. The new system can be phased in, according to application or location, and the old system gradually replaced. In some cases, it may be more cost-effective to shut down the old system and implement the new system all at once.

7) Upkeep and maintenance: This step involves changing and updating the system once it is in place. Hardware or software may need to be upgraded, replaced or changed in some way to better fit the needs of the end-users continuously. Users of the system should be kept up-to-date concerning the latest modifications and procedures.

In addition, other steps which may appear include project initiation, functional specifications, detailed specifications, evaluation, end-of-life and other steps that can be created by splitting previous steps apart further.

2.3 Acceptance of information technology

In this study, we used Unified Theory of Acceptance and Use of Technology (UTAUT)-based concept of Venkatesh et al. (2003; 2012). UTAUT is a comprehensive synthesis of prior technology acceptance research and has four key constructs: (1) performance expectancy, (2) effort expectancy, (3) social influence and (4) facilitating conditions. These key constructs have been adapted these constructs and definitions from UTAUT to the consumer technology acceptance and use context. Here, performance expectancy is defined as the degree to which using a technology will provide benefits to consumers in performing certain activities; effort expectancy is the degree of ease associated with consumers' use of technology; social influence is the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology; and facilitating conditions refer to consumers' perceptions of the resources and support available to perform a behavior (e.g., Brown & Venkatesh 2005; Venkatesh et al. 2003).

3. Materials and methodology

3.1 The old moat of NCM

This study area is in administrative area of NCM, Ni-muang sub-district, Muang Nakhonratchasima district, Nakhon Ratchasima province, Thailand (the northeastern region of Thailand). Geographically, study area located from 14°58´48.74´´-14°58´11.41´´ N to 102°5´50.52´´ - 102°6´51.164´´ E. Land Use is covered by most build-up areas and streets where include so importantly cultural places such as Thao Suranaree monument and 6 temples (Bueng, Sakaeo, Bon, E-San, Phra Narai Maharat, and Phayap) as Figure 1.

In addition, the essential reasons of study area selection comprise of:

1) This study area will be developed as Korat Smart City from Memorandum of Understanding (MOU) in project named, 'Korat Smart City' under the concept of "smart city, safe city to the city of happiness" (Office of Nakhonratchasima City Municipality, 2019a).

2) Travelling in and out of the old moat of NCM was also higher than 100,000 people-travel per day (Office of Transport and Traffic Policy and Planning, 2017).

Figure 1. The old moat of NCM including position of Thao Suranaree monument and 6 temples

3.2 SDLC Methodology

In this study, SDLC methodology comprises of 5 steps as Figure 2 and details follows these following steps:

3.2.1 Data collecting and analysis

1) Reporting the existing and future situation of cultural tourism from NCM development plan year 2018-2021.

2) Interviewing officers of tourism promotion from NCM and visitors who visited at Thao Suranaree monument and 8 temples above.

This interviewing was determined both closed and opened questions-based web drafting (this was roughly sketched by researches in this study). The closed questions comprised of how is dividing headers, content sections, footer sections of the page, how is suitable character such size, style, color for this web etc. The opened question was suggestions from the responded officers and visitors.

3.2.2 Plan and requirement

This step follows to the obtained data from step1 based on reporting about cultural tourism from NCM development plan year 2018-2021 and interviewing from the concerned-NCM officers and visitors who visited at Thao Suranaree monument and such temples above.

3.2.3 Design and development

1) Information of Thao Suranaree monument and such temples include activities in normal day and special day, time and duration of activities' occurrence, routes' accessing and linkage.

2) Web design and development-based SDLC and integration of skeleton and surface plane were designed and developed for nice website-based requirements of 3.2.1. Nice web consists of comfortable color, character size and style, beautiful and obvious pictures or photos, using Google map for displaying routes, concise contents, and website flexibility for displaying of internet-connected devices. Moreover, this web was designed by context diagram (Figure 3) and data flow diagram (Figure 4) and was developed by software i.e. AppSServ version 8.6.0 for database management and Word Press Version 5.0.2 for web design and development.

3.2.4 Testing evaluating and deployment

1) Web testing includes functionality, usability, interface, compatibility, performance, and security.

2) Evaluating includes experts and users. The 5 experts evaluated in term of contents and system design and development. On contrary, users were evaluated with acceptance of this web information system-based concept of Venkatesh et al. (2003; 2012). User were divided into 2 groups

2.1) The 5-officer of tourism promoting from NCM was surveyed with a purposive method.

2.2) The 389-visitor who visited at Thao Suranaree monument and such temples from September 1 to December 31, 2019, was surveyed with random sampling method. 389 visitors came from calculation of sample size-based exact population (14,330 tourists are reported in Office of Nakhonratchasima City Municipality (2019b).

Moreover, this acceptance evaluation of web information system used concept of Venkatesh et al. (2003; 2012). This study designed questionnaires for this evaluation. Questionnaires were checked by Index of item Objective Congruence (IOC)-based experts. Questionnaire was used for this evaluation, had 3 parts: (1) general data (i.e. gender, age, frequency of technology using for data searching), (2) acceptance of this web information system included 8 questions: providing accurate and useful information for cultural tourism in study area; accessing easy for users; suggesting or telling others for using this web; ability of all devices' linkage with internet; interesting and attracting for using through satisfaction; assessing value of web usage, servicing data and returning use data again; overall of this web, and (3) suggestions

For part 2 of questionnaire, it was designed in form of rating scale as: 5 means the highest agree; 4 means the high agree; 3 means the middle agree; 2 means the low agree; 1 means the lowest agree. And then such rating scale was interpreted by score range, 4.20-5.00 mean the highest acceptance; 3.40-4.19 mean the high acceptance; 2.60-3.39 mean the middle acceptance; 1.80-2.59 mean the low acceptance; 1.00-1.79 mean the lowest acceptance.

3) Deployment of this web was requested with operating domain registration and then is taken to previously post on web of office of NCM (https://www.koratcity.go.th/) and then will be operated by public relations into the related web of other agencies i.e. Tourism Authority of Thailand Northeast Region (https://www.tourismthailand.org/nakhonratchasima) and office of tourism and sport Nakhonratchsima (https://nakhonratchasima.mots.go.th/).

3.2.5 Maintenance

In the initial stage, researchers in this study and officers of tourism promotion from NCM will help each other to maintain this web such as change and update data and information through upgrading hardware and software. Researchers in this study will not only work together but we also trains web maintenance for officers of tourism promotion from NCM also.

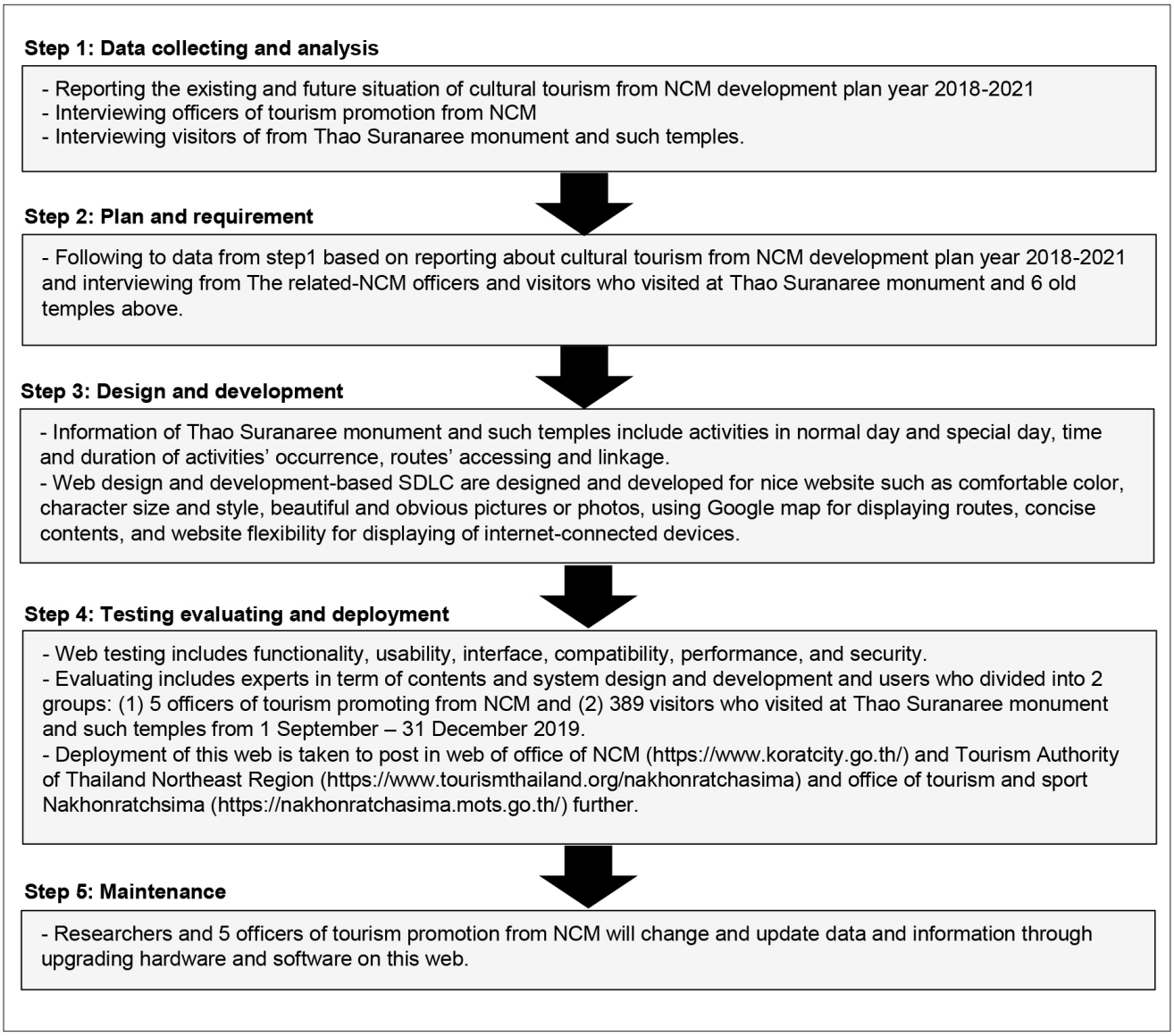


Figure 2. The SDLC methodology for this study

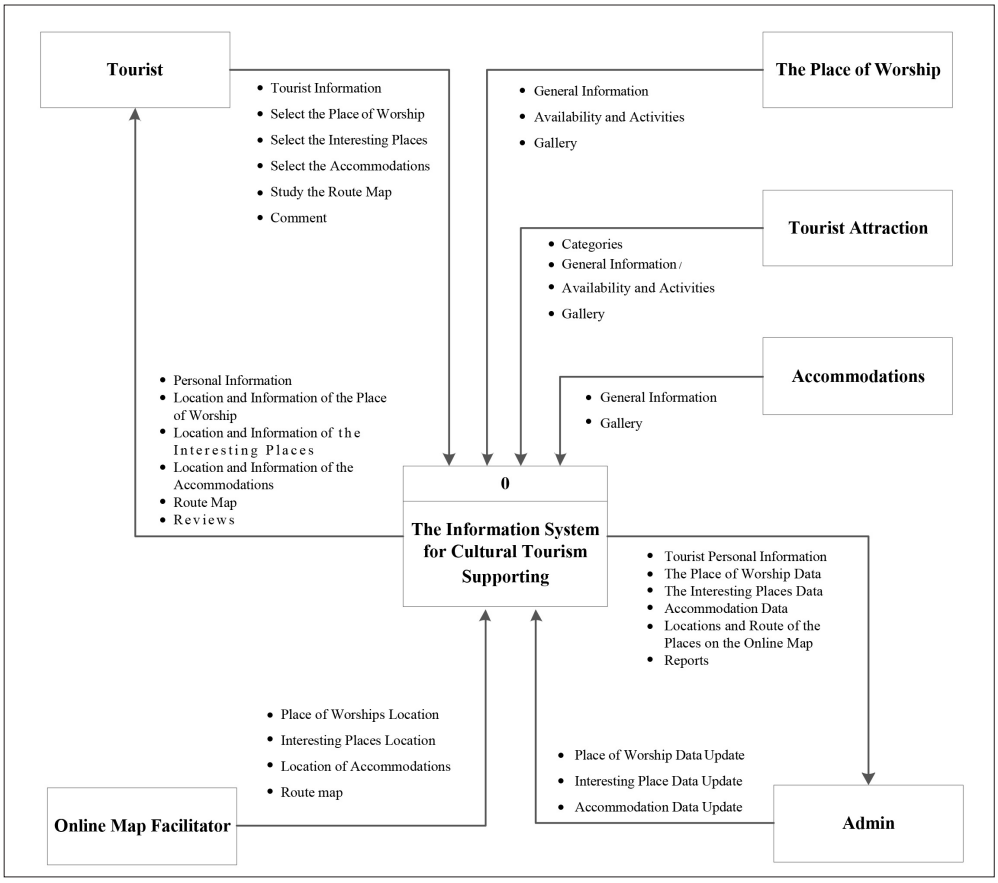


Figure 3. Context diagram for this web development

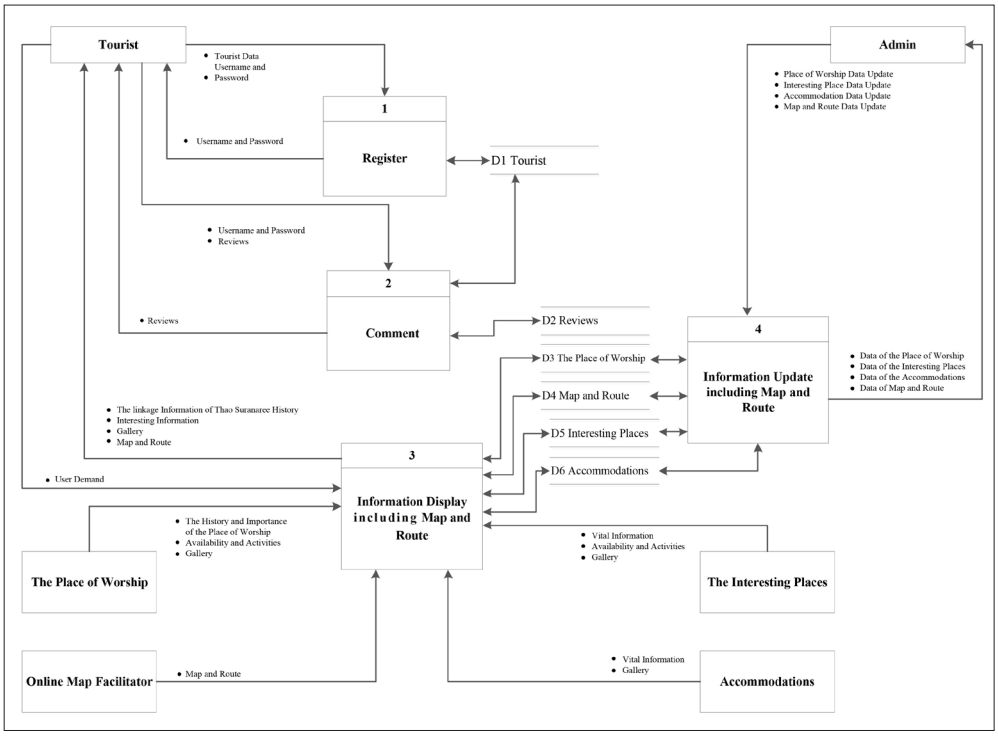


Figure 4. Data flow diagram for this web development

Figure 5. Activities and time of Wat Bueng

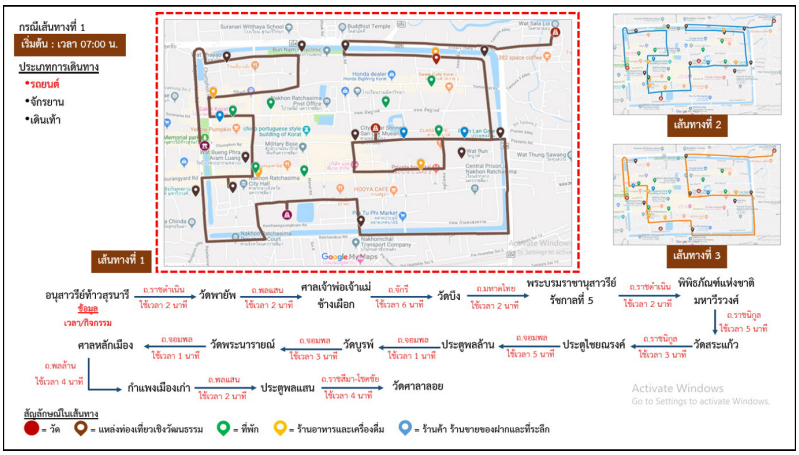


Figure 6. Routes with information in Thai of Thao Suranaree monument and 6 temples in study area.

4. Results and Discussions

4.1 Data and information for presenting on this web information system

4.1.1 Activities and time

This study provided information of activities and time of such activities in Thao Suranaree monument and 6 temples above for presenting on this web. Figure 5 showed example of Wat Bueng that explored details of time and activities from 06.30 am to 18.00 pm.

4.1.2 Routes for Thao Suranaree monument and 6 temples

This study planned routes for cultural tourism in the old moat of NCM. In this study, THao Suranaree monument is origin while 6 temples above are destination. Figure 6 showed routes of Thao Suranaree monument and such 6 temples.

4.1.3 Languages for this web

In general, website includes both Thai and English including this web too. Especially, this web has designed for local language or called, 'Korat language' for especial Korat people and for other language i.e. Japanese, Chinese, German etc. further

4.2 Accessing for this web information system

This web information system is developed for cultural tourism in the old moat of NCM and can visits at www.yamocitytour.com. In this study, there are 7 places of cultural tourism that are proposed i.e. Thao Suranaree Monument and 6 temples (Beung, Sa Kaeo, Bon, E-San, Phra Narai Maharat, and Phayap). These were presented on this web based on activities and activities' time and routes' accessing.

This web information system has divided into 2 levels as follows:

1) Administrator

People who are formally allowed to manage this website such as contents, user's accessing and controlling changes of overall website. Administrator can login to manage this web as Figure 7.

2) User

People who can only access the user interface such as webpages, contents, pictures, web links etc. as Figure 8.

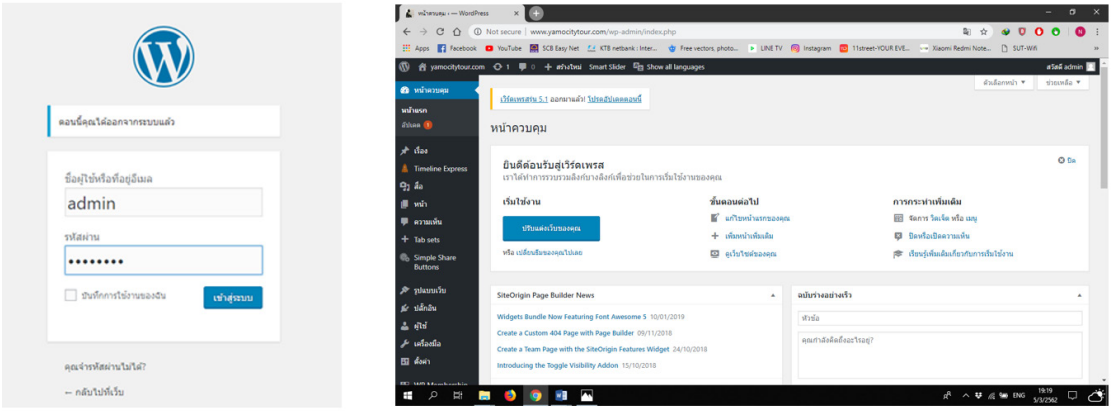
4.3 Efficiency evaluation of this web information system-based experts

This web was evaluated by 6 experts. The 3-expert evaluated contents while the 3-expert left was used for evaluating web design and development. Overall of experts' evaluation was found that was in good level with 4.12 of mean (0.21 of S.D.).

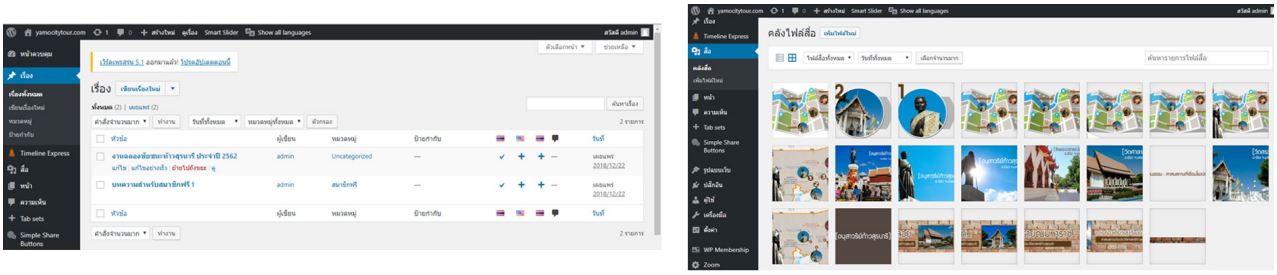
4.4 Acceptance Evaluation of this web information system

4.4.1 Offices of tourism promoting from NCM

There were 5 officers of tourism promoting from NCM. The 5-officer included male 2 people and female 3 people and age



(a) Screenshot for login (Left) and managing web (Right)



(b) Screenshot for managing contents (Left) and organizing media files (Right)

Figure 7. Administrator's responsibility for this web

(a) Screenshot for the first web of visitors accessing

(b) Screenshot for web page of activities and time of Thao Suranaree monument

(c) Screenshot for web page of routes from Thao Suranaree monument to temples

Figure 8. Users' accessing for this web

Table 1. Acceptance evaluation of this web-based the 5-officer of NCM and 389-visitor

Questions	Officer of NCM		Visitors	
	Average	Acceptance level	Average	Acceptance level
1. Providing accurate and useful information for cultural tourism in study area	4.00	High	3.29	Middle
2. Accessing easy for users	3.80	High	4.25	Highest
3. Suggesting or telling others for accessing or using this web	3.75	High	3.35	Middle
4. Ability of use on all devices with internet access	3.87	High	4.21	Highest
5. Interesting and attracting for using this web through satisfaction	4.11	High	3.41	High
6. Assessing value of web usage	4.00	High	3.40	High
7. Providing data and returning use data again	4.00	High	2.75	Middle
8. Overall of this web	4.00	High	3.43	High
Total	31.53	-	23.84	-
Average	3.94	High	3.41	High

between 26-55 years. Overall of acceptance evaluation for this web explored in good acceptance with 3.94 of mean (0.43 of S.D.) as Table 1. Acceptance of this web is high level. Question no.5 (interesting and attracting for using this web through satisfaction) was accepted with the highest score (4.11) while question no.3 (suggesting or telling others for accessing or using this web) was accepted with the lowest score (3.75).

4.4.2 Visitors in study area

There were 389 visitors who visited Thao Suranaree and 6 temples (Bueng, Sa kaeo, Bon, E-San, Phra Narai Maharat and Phayap). These visitors were surveyed-based random sampling method from September 1-December, 2019. The 389-visitor included male 138 people (56 foreign and 82 Thai people) and female 251 people (61 foreign and 190 Thai people) and age between 16-75 years. Overall of acceptance evaluation for this web showed level of middle acceptance with 3.41 of mean (0.32 of S.D.) as Table 1. Acceptance of this web is between middle and high level. Question no.2 (accessing easy for users) was accepted with the highest score 4.25 while question no. 7 (providing data and returning use data again) was accepted with the lowest score (2.75). Moreover, there are most suggestion from visitor about weak Wi-Fi signal or no Wi-Fi signal in some areas such as Wat E-San and Wat Bon.

5. Conclusions

As conclusions, the results of this study were divides into 3 parts: (1) presentation of data and information on web, (2) web design and development and (3) acceptance evaluation of this web. Firstly, data and information consisted of Thao Suranaree monument and 6 temples with activities, time and routes' access. Secondly, web information system-based cultural tourism in the old moat of NCM was designed and developed by SDLC methodology. This web was tested by researchers in term of functionality, usability, interface, compatibility, performance, and security. Then web efficiency was evaluated by 6 experts in issue of contents and web design and development for improve this web before it was taken to assess web acceptance. Overall of experts' evaluation was found that was in high level with mean 4.12 (S.D. 0.21). Finally, this web effectiveness was evaluated by users, were divided into 2 groups: 5 officers of tourism promotion from NCM and 389 visitors in study area. The first group was surveyed by the purposive method while the second group was surveyed by random sampling method. Surveying used questionnaires that included 3 parts: (1) general data, (2) acceptance evaluation of this web, and (3) suggestions for this web. Overall of all 2 groups was in high acceptance. The 5-NCM

officer showed this web acceptance at mean 3.94 (S.D. 0.43) while 389-visitor showed this web acceptance at mean 3.37 (S.D. 0.24). In addition, most suggestions included accessing weak Wi-Fi signal of NCM. Consequently, this study has recommended the concerned NCM office should improve Wi-Fi signal of NCM for visitors' accessing before this web information system-based cultural tourism in the old moat of NCM will be registered by domain named, www.yamocitytour.com and previously implemented in web of office of NCM (https://www.koratcity.go.th/) and the related web i.e. Tourism Authority of Thailand Northeast Region (https://www.tourismthailand.org/nakhonratchasima) and office of tourism and sport Nakhonratchsima (https://nakhonratchasima.mots.go.th/) further.

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