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# A Preliminary Development of Virtual Sightseeing Website for Thai Temples on Rattanakosin Island

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***Abstract*—**Currently, the sources of cultures and tourist attractions are presented in online documentary form only. In order to make them more virtual, the researcher then collected and presented them in the form of Virtual Temple. The prototype, which is a replica of the actual location, was developed to the website and allows people who are interested in Rattanakosin Island can see in form of Panorama Pan View. By this way, anyone can access the data and appreciate the beauty of Rattanakosin Island in the virtual model like the real place.

The result from the experiment showed that the levels of the knowledge on Thai temples in Rattanakosin Island increased; moreover, the users were highly satisfied with the systems. It can be concluded that virtual temples can support to publicize Thai arts, cultures and travels, as well as it can be utilized effectively.

***Keywords*—**Virtual sightseeing, rattanakosin island, Thai temples.

## I. Introduction

WHEN it comes to arts and cultures in Rattanakosin Island, Thai temples are seen as the historic sites where are worth to preserve and allow both Thai people and foreigners to be able to see the importance of cultures of the country. In the past, the temples were connected with the community both in the city and in the rural areas. The temples are not only for making merit and used as a relaxing place , but also were a school for children where they could be educated by the monks who stayed there. However, the changed world, as well as the new tradition, increasingly created the gap between people and the temples particularly Buddhist temples. This phenomenon is a very much concern. In the sense that if one day in the future, they grow up into adults, and have not been instilled with the importance of the temple to the younger generations. The temples in the minds of the next generations, it may disappear from their thought, perception, and awareness.

Modern technology is rapidly developing in the systems, computer programming, internet, websites, and etc. These influence on helping educate people which still have some limitation as mentioned before. The uses of appropriated media in teaching are necessary to enhance the recognition efficiently. Furthermore, the efficiency of modern computers and advanced computer programs without limitation make them be able to process data, images, audios, and messages effectively. Moreover, Virtual System is an innovation that helps support learning, and fulfills the knowledge of audience, students, and people in general who may be interested.

Of such problems and the advantages of advanced computer technology, the researcher would like to promote the arts and cultures of Thai temples in Rattanakosin Island by developing the virtual system for visiting the temples through the electronic media in order that Thai people can see the beauty and the uniqueness of the Thai cultures. This research is included: Section II discusses related works. The framework of this paper is described in Section III. The development system and evaluation system explained in Section IV. The Results and discussions from the experiments are presented in Section V. Finally, the conclusion and future work are given in Section VI.

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## II. Related Work

Virtual Temples which are transformed by the modern computer technology will be appealed to visitors. Through the advancement of computer technology, communications systems, and the internet, the audience can see pictures and movies in 360 degree so that they may feel like they are in the real places. These virtual temples are included Wat Phra Kaew, Wat Po, Wat Chana Songkram, Wat Ratchapadit, Wat Bowonniwet, Wat Ratchbophit, Wat Suthat Thep Wararam, Wat Ratchanaddaram, Wat Saket, Wat Ratchaburana, Wat Makutkasat, Wat Somanas Rajavaravihara, and Wat Benchamabophit Dusitvanaram.

Creating a virtual museum to learn the history or realistic images will help the audience feel like they are really in the real place where the exhibitions are displayed. Preparing by the museum itself, the audience will have a chance to gain more experience in learning together with satisfaction.

Volkan Islerand et al. [1] have created a system for the analysis and display of a collection of Native Californian baskets of Phoebe A. Hearst Museum of Anthropology. This research differs from existing cultural heritage applications in terms of the focus on tools and techniques to display objects, and to study the related ones. In the case of the basket, researchers developed a model in 3D, and exhibits in virtual view.

Chai Yu Tai [2] has created a guide for temples in Taipei for tourists. This research focuses on using Macromedia Flash program as a tool in creating parts of the tour in order to be used in Pocket PC. The user can interact with the map by the interactive panoramic images showing places where they want to see or where to go on the map immediately. Tourists can travel more easily and faster through information and images that appear in the panoramic virtual on Pocket PC.

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LI Fung-Chun and et al. [3] studied the effect of using a virtual environment that affect the learning of students in National Tainan Teachers College, Department of Earth Science by dividing into two groups: the experimental group learned to create websites with VRML language and the first control group learned from the virtual environment of the mountain city images in 3D. The second control group of students learned from normal method then measured their understanding of the difference of the scores on the test before and after learning (Pre-test & Post-test). The results concluded that the use of virtual reality making the students better understand than the students who studied through normal pictures. Thus, the freely control system will help them better in learning and in exploring the environment.

Dusan Pavlicek [4] was able to place the model in computer science using virtual panorama for Panoramic Model of the Department of Computer Science, FEE CTU. The purpose of the research was to create a model place of computer science using Quick Time VR: QTVR, where the audiences are feeling as they are in the real place, and can really set the direction to walk in, and view information about the property as well. Napapon Yodsin [5] studied the effect of using panoramic virtual slides in the study on the web for the academic achievement of students at Mattayom 4. The study found that students learned from field trips on the Web by using panoramic virtual could achieve better than students who studied with educational field trips on the Web by using a slide.

T. Hagward [6] said the three-dimensional and three-dimensional animation has been applied widely in the study of science or learning of the true or real environment may require substantial costs. Hence, three dimensions will become really important in the education.

Gonwatchara Khainaga [7] built a museum presentation about Thai architecture: case study Thai Lue houses, and studied the effectiveness of learning in virtual presentation. The study found that following the virtual media museum of Thai Lue houses, the understanding of students.

Warada Poompaga [8] studied the education content and site layout of Thai museum websites. The samples are registered and unregistered websites with the names of "museums" in the sites, and there is a direct link to the page with the content of the museums for 28 sites in Thailand. The study found that, in terms of content, the content is mainly the history of the museum, and objects in museum, exhibition, and activities. The advertising section in the website did not focus on using multimedia both Thailand and English language together with links to other sites. In addition, they did not install chat rooms and online activities to entertain the audience.

This paper uses different views to enhance sightseeing website for Thai temples by using virtual system for publicize cultures and travels.

## III. Framework for a Preliminary Development of Virtual Sightseeing Website for Thai Temples

In conducting research on Rattanakosin Island, the researcher designed a website to introduce temples in order to promote tourism and also to be important sources for retrieval. The data can also be the guild to travel. A framework is follows in Fig. 1. The methodology combines with seven steps.

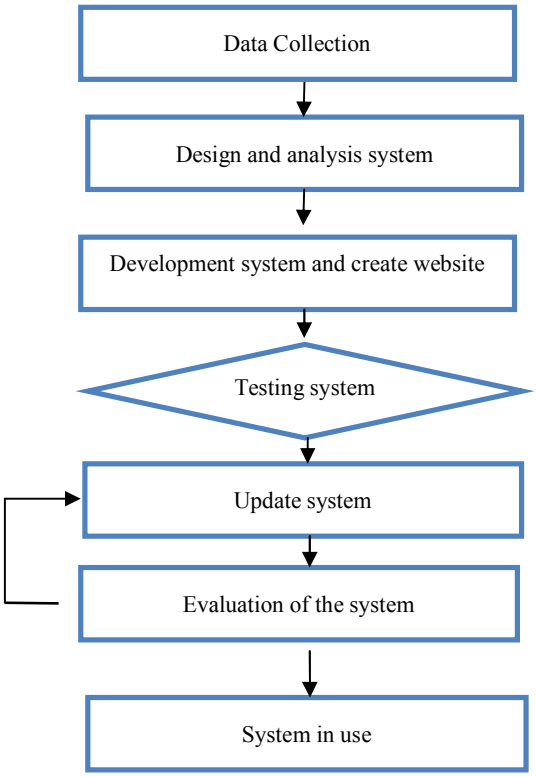


Fig. 1 A Framework for A Preliminary Development of Virtual Sightseeing Website for Thai Temples

1) *Data Collection:* The researcher conducted the study and data collection of the history of the site and actual image of the real locations for 3 temples including Wat Saket, Wat Suthat Thep Wararam, and Wat Arun.
2) *Design and analysis systems*: System analysis and design a simulated modeling website was to show the performance of the system which is combined of 3 temples including: Wat Saket, Wat Suthat Thep Wararam, and Wat Arun. Each temple will have details of the history, the administration, the former pastors, the temple architectures. The virtual temples will illustrate in a virtual environment, location, and travel.
3) *Development system and website:* The researchers have conducted a multiple virtual sites for three primary Thai temples that are Wat Saket, Wat Suthat Thep Wararam, and Wat Arun as the analysis and design of the system.

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4) *Testing system: This step is to perform a functional test of the system in accordance with the process analysis and system design.*
5) *Update system: Update system are to improve the process of gathering a user's query results, and then bring the conclusion of such a site to improve efficiency, and maximize the benefits. Errors must be minimal in order to meet site requirements.*
6) *Evaluation of the system: Evaluation of an experimental system can be done by using a sample of individuals who can play the Internet, the trial system from a questionnaire. Then, the derived results will be calculated for the significance level to achieve the desired goals.*
7) *System in use: This step is to introduce to use online through internet system.*

## IV. Development and Evaluation System

This section contains two parts: the development and evaluation of the system.

### *A. Development*

The researchers have developed the system using Visual C # and the development of virtual images by combining images to make panoramic photos from a digital camera.

Fig. 2 Example of Temple images

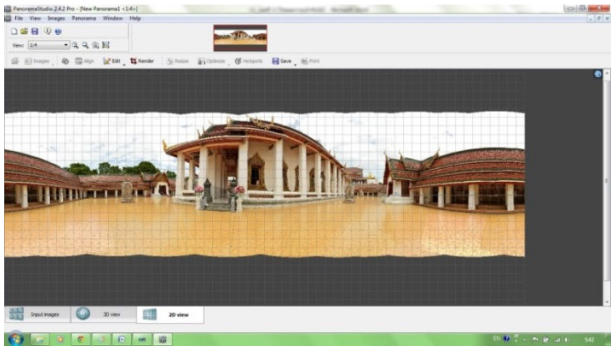

Fig. 3 Process of merging temple image

Fig. 4 The result of virtual sightseeing system for Thai temple

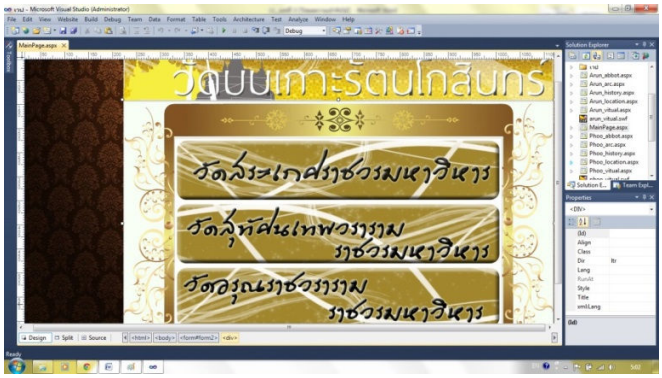

Fig. 5 The interface of virtual sightseeing website

### *B. System Evaluation*

The researcher invited the deployment of 30 people consisting of students and guests for an application in the evaluation. By evaluating the performance of the system and satisfaction with the site, the researcher used statistics to analyze the satisfaction of the sample test site and test T-test to check the knowledge of the Thai temples on Rattakosin Island before and after use the different systems.

## V. Result and Discussion

The results of the assessment level of satisfaction with the virtual site found that the overall average was 4.40, and reliability was 0.648, which is good as displayed on the following table. The results appear in Table I. The research on the development of virtual instrumentation described the concept which draws a person who loves to learn about the traditions and culture of Thai temples. Currently, any websites that recommend the uniqueness and beauty of Thai temples for people who want to use services that meet the most requirements is a good idea. However, the design of the website lacks of credibility because the site was designed with the simulation only does not appeal to those interested in the study and not recommend the beauty of the temples of Thailand properly.

TABLE I
THE RESULTS OF THE ASSESSMENT

| *No* | *Assessment Items* | *Overall Average* | *Reliability* | *Evaluation Criteria* |
|---|---|---|---|---|
| 1 | Know more in details of Thai temples | 4.55 | 0.32 | Good |
| 2 | Access to the contents easily | 4.46 | 0.57 | Good |
| 3 | Clear menus and work well | 4.33 | 0.66 | Good |
| 4 | Clear classifications and appropriate | 4.46 | 0.62 | Good |
| 5 | Website design is beautiful to visit | 4.33 | 0.60 | Good |
| 6 | The format of the site is as the user's need | 4.30 | 0.79 | Good |
| | Total | 4..40 | 0.65 | Good |

To test the mean difference by use assumption that the knowledge of user about Thai temple between before (*BVSModel*) and after (*AVSModel*) use virtual sightseeing system are difference, a paired-sample T test is employed. Assume that the sample comes from populations that are approximately normal with equal variances. Level of significance is set to 0.05 ($\alpha$=0.05). The results can be summarized as follows:

TABLE II
PAIRED-SAMPLE T TEST

| *Pair* | *Pair differences* *Mean* | *Std. Deviation* | *Std.error Mean* | *Sig (2-Tailed)* |
|---|---|---|---|---|
| *BVSModel-AVSModel* | .082 | .320 | .112 | .002 |

The statistical testing result from Table II indicates that there is a significant difference in the confidence values of the *BVSModel* and *AVSModel* at $\alpha$=0.05. In other words, the mean scores of confidence values of *BVSModel* and *AVSModel* are not the same.

## VI. CONCLUSION AND FUTURE WORK

This research is to develop the virtual view system for Thai temple on Rattanakosin Island, and conducted from a variety of sources of knowledge, real locations, and actual development of the site to make recommendations based on the needs of the individual as much as possible.

The result of the development of virtual temples leads to the ability to illustrate the data to the audience properly, easily, and simply. It is suited to all ages. Moreover, the contents in the site meet the need of the users. Furthermore, the system can work continuously and efficiently. The look of the site is beautiful to use, appropriate, and in accordance with the contents. It also found that the knowledge gained from the use of virtual machines for visiting Thai temples on Rattanakosin Island as well.

For future research on the Thai temples virtual systems on Rattanakosin Island, there should be more contents of Thai temples on Rattanakosin Island completely, as well as a social network of sharing opinions of its users including a website devoted to the AEC or the accepted standard according to the Thai arts and cultures about temples.

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