Development of a Vegetation Searching System

Rattanathip Rattanachai, Kunyanuth Kularbphettong

Abstract—This paper describes the development of a Vegetation Searching System based on Web Application in case of Suan Sunandha Rajabhat University. The model was developed by PHP, JavaScript and MySQL database system and it was designed to support searching for endemic and rare species of trees on Web site. We describe the design methods and functional components of this prototype. To evaluate the system performance, questionnaires for the system usability and Black Box Testing were used to measure expert and user satisfaction. The results were satisfactory as followed: Means for experts and users were 4.30 and 4.50, and standard deviation for experts and users were 0.61and 0.73 respectively. Further analysis showed that the quality of the plant searching Website was also at a good level as well.

I. INTRODUCTION

SUAN Sunandha Palace was the home of several of King Rama V's consorts and daughters. The King incorporated many European concepts into his residences in order to ensure healthier living conditions for his family and courtiers. The large gardens at Dusit and Suan Sunandha palaces are good examples of this ''modern'' use of space [1]. Moreover, Suan Sunandha palace was the garden of King Rama V's reign and there are various valuable types of endemic and rare species grown at this place. With time and policies changing, some plant species have been lost or have decreased. Therefore, to preserve and maintain plants, rare plant species database is important for interested users to search and study information. For examples, BGO Plants Database [2] is developed to collect information of plants in order to give knowledge in medicine for the social networking society and it is also shown the garden's map so that people can find all living plants through this database [3]. Moreover, ITIS [4], [5], the Integrated Taxonomic Information System, is the partnership of federal agencies which formed and submitted taxonomic data from the world scientific community and it collects and assigns a Taxonomic Serial Number (TSN), a unique and persistent scientific identifier of biological organisms.

With the rapid development of technology, web technology is one of the easiest fastest efficient approaches to access and search online. With web-based application used as the interface, the user can access the application from any computer connected to the Internet using a standard browser, instead of using an application that has been installed on their local computer [6]. It also assists to interest users to study and

Rattanathip Rattanachai and Kunyanuth Kularbphettong are with Computer Science Program, Suan Sunandha Rajabhat Univesity, Bangkok, Thailand (phone: 662-160-1159; e-mail: rattanathip.ra@ssru.ac.th, kunyanuth.ku@ssru.ac.th).

query information of rare plant species in Suan Sunandha Palace. Hence, the development of this project creates significant opportunities to interest users in learning and searching knowledge of the history of plant species especially for this palace. The web application is available through Internet and web users can edit and store data online.

The system makes it convenient for interested users to get through and retrieves data any place and any time.

The remainder of this paper is organized as follows: Section II presents the analysis and design of this work; Section III presents the results evaluated by experts and users; finally, Section IV concludes the paper with future work.

II. ANALYSIS AND DESIGN

In order to develop this project, data was surveyed and collected from plant biologists in place at Suan Sunandha Palace and their information was used as an important source for implementation of the web application. Then, as Fig. 1 shows, user requirements were analyzed for the design processes of the system applied database technology and network technology to make system fast and easy to use. This web application is compatible with the Web Browser on the Internet and the display uses HTML and PHP.
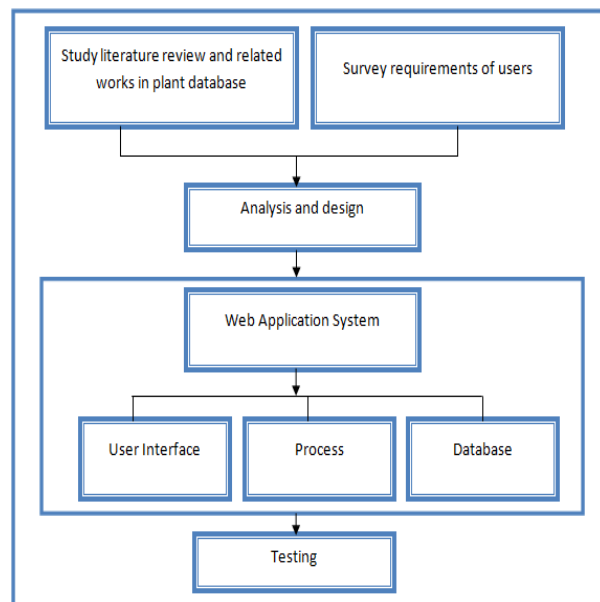

Fig. 1 Frame work of the development of Web Application

According to study characteristic of plant data, the scope of the system was divided into 3 groups as follows: formats of data like text, images, drawing and animation, the

classification approach classified by family, genus, etc.; and the protection and preserve approaches. Also, to design and implement a web system, we separated design system processes in to 4 parts: the structure of website part; user interface part; process parts; and data base part as shows in Fig 2.
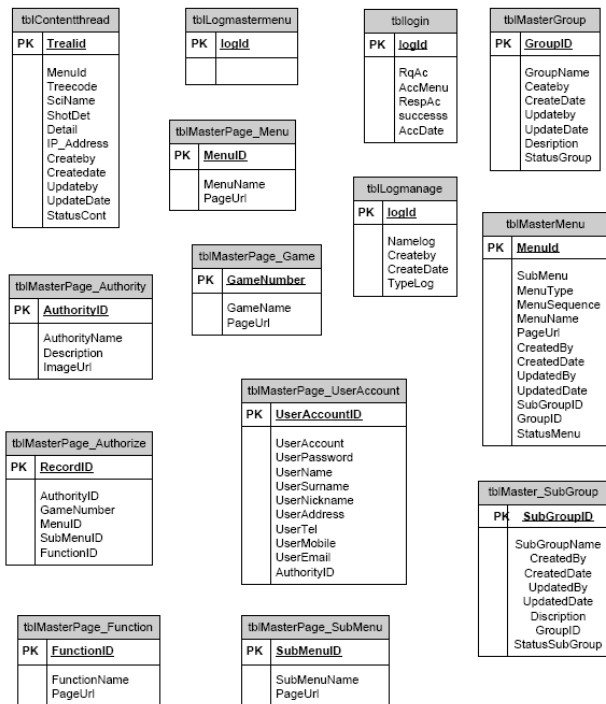

Fig. 2 Database of the web application

The system can be divided into be 3subsystems as follows: a user management system, a plant management system, and a publish relation system.

In a user management system, user can subscribe his/her profile such as personal information, email address, username, password, etc. A plant management system can immediately insert/delete and update plant information. Moreover, this system allows user to learn and retrieve plant information by using a search system.

To test and evaluate the web application system, Black box Testing and Questionnaires with experts and users were applied. Black box testing was tested based on the performances of the system and collected the errors of the system. Questionnaires were tested for user satisfaction. To evaluate the quality assessment system, Mean (x) and standard deviation (SD) were used to assess the qualities of the project.

III. RESULTS

The results for the purposes of the project were divided into 2 parts: the result of developing the web based application for searching plant species in case of Suan Sunandha Palace and the result of testing and evaluating the qualities of this system.

A. Developing the Web Based Application Searching Plant Species in case of Suan Sunandha Palace

From Figs. 3 to 6 were shown the results of web application.

Fig. 3 The main page of web application

Fig. 4 An example page of web application
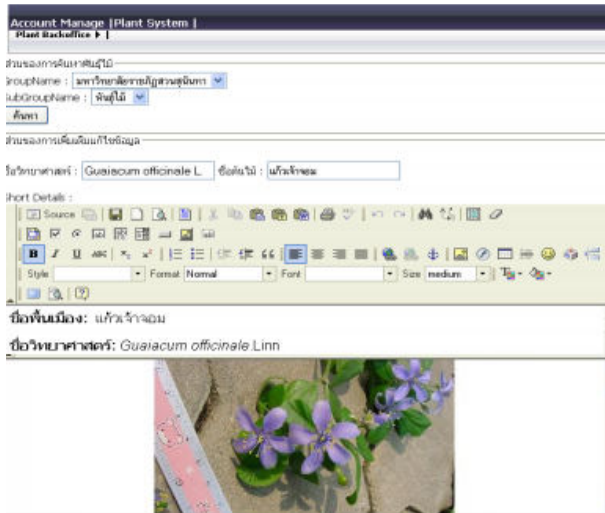
Fig. 5 Aback end page of web application

Fig. 6 A back end page of web application

B. Testing and Evaluating the Qualities of the System

To test and evaluate the qualities of the system, Black box Testing and Questionnaires by experts and users were used to test and evaluate this project. Black Box testing indicated the error of the prototype as follows: Functional Requirement Test, Function Test, Usability Test, Performance Test and Security Test.

The Functional Requirement Test evaluated the ability of the system to serve the needs of the users and the Functional Test was used to evaluate the accuracy of the system. The Usability Test tested the suitability of the system. The Performance Test assessed the processing speed of the system. Finally, the Security Test was used to evaluate the security of the system Table I shows the results of Black box testing.

TABLE I
THE RESULTS OF BLACK BOX TESTING

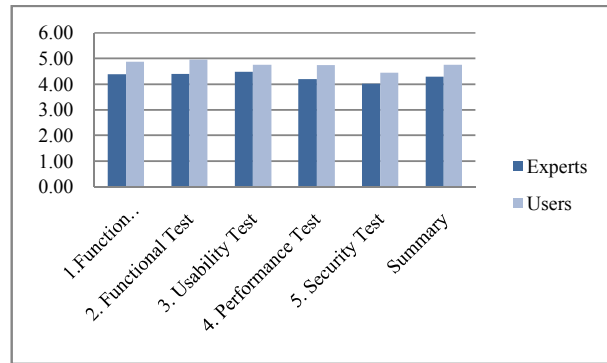|	Experts		Users	
	$\bar{x}$	SD	$\bar{x}$	SD
1.Function Requirement Test	4.39	0.60	4.87	0.74
2. Functional Test	4.40	0.66	4.96	0.81
3. Usability Test	4.48	0.66	4.76	0.73
4. Performance Test	4.20	0.45	4.75	0.60
5. Security Test	4.02	0.67	4.45	0.75
Summary	4.29	0.61	4.76	0.73

Fig. 7 The results of Mean

The results of user satisfaction by using Questionnaires were found that Means for experts and users were 4.30 and 4.50, and standard deviation for experts and users were 0.61 and 0.73 respectively.

IV. CONCLUSION AND FUTURE WORK

In this paper, the preliminary results of developing this web based application for searching plant information were presented. This prototype can be beneficial to manage and retrieve endemic and rare plant species info in the case of Suan Sunandha Palace. Though, in term of the future development, other advance technologies and techniques were applied to enhance this project and were also applied as a tool to manage a plant searching system.

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Rattanathip Rattanachai graduated M.S. Computer Science and interested in Web-Based system, and Neuron and Data mining techniques**.**

Kunyanuth Kularbphettong received the B.S. degree in Computer Business, M.S. degree in Computer Science, and Ph.D degree in Information Technology. Her current research interests are in Multi-agent System, Web Services, Semantic Web Services, Ontology and Data mining techniques.