CHAPTER 4

RESULTS

This chapter mainly focuses on the results and analysis based on the methodology stages using case study of e-Tourism curriculum plan in Chiang Mai University, Thailand and Chengdu University, China.

1. Interview results

2. Knowledge model

3. KMS design and development

4. Knowledge creation process

5. KMS user satisfaction

The first stage is the result of knowledge analysis and synthesis by using CommonKADS-structured interviews. The structured interviews have been carried out with e-Tourism curriculum development experts: e-Tourism lecturer, e-Tourism researcher, Curriculum designers in Chiang Mai University, Thailand and Chengdu University, China. A knowledge pack of e-Tourism curriculum plan is modeled in this stage. The second stage is KMS design and development which will demonstrate the result of system prototype based on ISO12207 process reference model. After KMS implementation, the stage of KMS evaluation will investigate user satisfaction by questionnaire. Five focus groups are selected as the users of this KMS; those are tourism students, tourism lecturers, curriculum designers, e-Tourism researchers and industry experts. After presenting the KMS, a questionnaire about the KMS

application on e-Tourism curriculum development was asked. The feedback and suggestions are collected and analyzed for effectively future KMS development.

4.1 Interview results

As described in Chapter3, CommonKADS was adopted to capture, analyze and validate knowledge from experts who possessed valued experience on e-tourism curriculum development by a series of semi-structured interviews. The objective of this step is to extract the knowledge from experts. The knowledge model is adopted in this step and to capture the experts' tacit knowledge into explicit form. In order to achieve this, the knowledge elicitation methods which were proposed in Chapter3, were adopted to deal with different processes of knowledge capture. In this knowledge modeling step, scoping meeting, knowledge capture meeting, case study meeting and validation meeting were carried out to interview experts. And the knowledge modeling included four main processes which are knowledge capture, knowledge analysis, knowledge validation and knowledge modeling.

The first scoping meeting was carried out to find out the critical task and experts list of e-Tourism curriculum development. The results of this scoping meeting are that the planning as the first important step of curriculum design was considered as the critical task of the whole e-Tourism Curriculum Development project. And a list of experts is provided to capture expert knowledge on e-Tourism curriculum plan. In the knowledge capture interviews, expert knowledge was categorized into 8 aspects on planning e-Tourism curriculum: e-Tourism developing trend; e-Tourism industry requirements; curriculum regulation; e-Tourism related curriculum analysis; experts; lecturers; budget; and technology and tools. Moreover, a knowledge base was set up

to describe who (experts), documents and information of e-Tourism curriculum plan
to help KMS users (see Table 4.1).

Table 4.1 knowledge elicitation methodology results

Knowledge elicitation methods	Outputs	Details
Scoping meeting	Critical task:	Planning is the critical task of e-Tourism Curriculum Development
	Experts list	1. Ms.Fujing 2. Ms.Pakinee Ariya 3. Mr.Chalermpon Kongjit 4. Mr.Komsak Meksamoot
Knowledge capture meeting	Task knowledge:	1. E-Tourism developing trend 2. E-Tourism industry requirement 3. Curriculum regulation 4. E-Tourism related curriculum analysis 5. Experts 6. Lecturers

Table 4.1 knowledge elicitation methodology results (Continued)

Knowledge elicitation methods	Outputs	Details
Knowledge capture meeting	Knowledge base	Who: Ms.Taksina Mr.Zhoujiliu Ms.Liuxuelian Document: WTO reports CMU curriculum regulation e-Tourism research books Information: www.wto.com
Case study meeting	Validated task knowledge More details	Add Budget and Technique& Tools in planning
Validation meeting	Validate knowledge model Some misunderstandings Some lack of details	Overall knowledge pack of e-Tourism Curriculum plan

4.2 The knowledge model

This step is to model knowledge for share among e-tourism curriculum development stakeholders. The knowledge model is based on the concept of Task-Inference-Domain which was proposed in the CommonKADS methodology. This aims at representing expert's tacit knowledge into explicit knowledge in the format of knowledge model. The knowledge model comprises three elements: Task knowledge, Inference knowledge, Domain knowledge. During this process, the knowledge engineer employed the knowledge elicitation technique which was described in

chapter3 to extract the body of knowledge from the expert. Many knowledge elicitation methods such as interview, questionnaire, or focus group, were proposed for achieving this process. Then, the body of knowledge (i.e. task, inference, and domain knowledge) was notated and modeled into semantic map format as shown below.
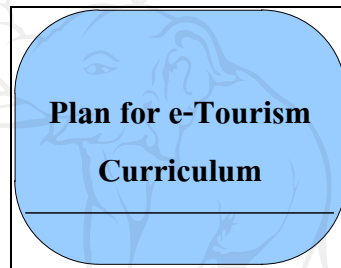
1) Task knowledge

Figure4.1 Task knowledge model

The task knowledge of this e-Tourism Curriculum Development was defined by knowledge expert as plan for e-Tourism Curriculum. As a curriculum development is complicated and long term work, planning is considered as the first and vital step of the curriculum development process, then how to plan an e-Tourism curriculum is the task knowledge selected.

2) Inference knowledge

In this inference steps, under the e-Tourism curriculum plan task, eight categories of inference knowledge were finally clarified in the figure shown as follows.
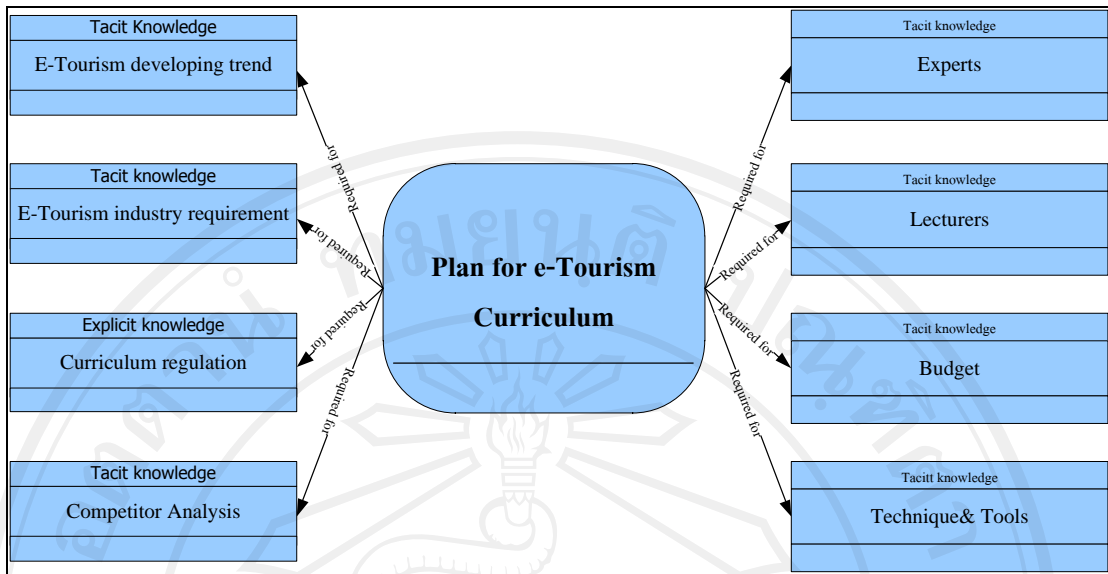
Figure4.2 Inference knowledge model

3) Domain knowledge

Finally, the domain knowledge focused on the e-Tourism Curriculum Development task knowledge were specified and showed in the following figures.
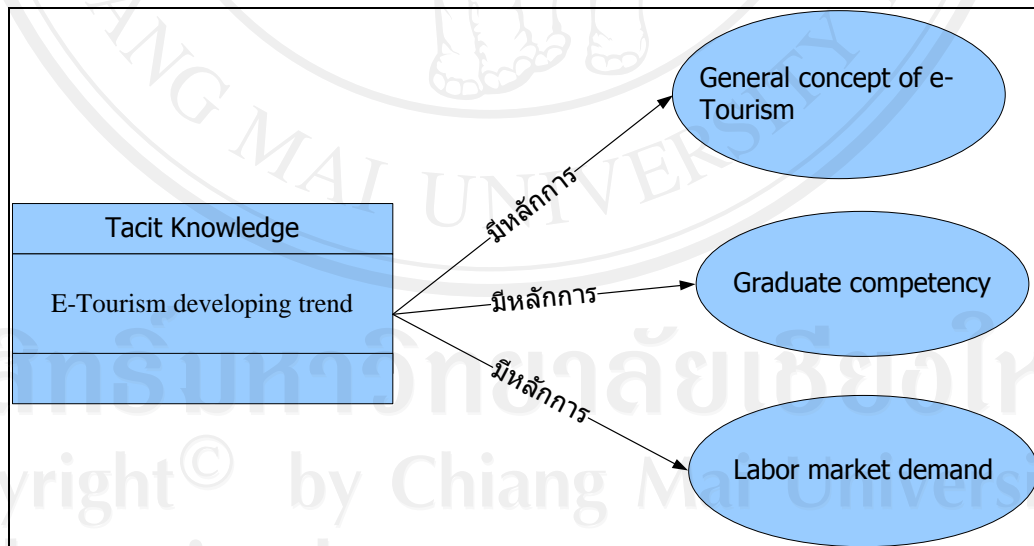

Figure4.3 Domain knowledge model

After finishing all task-inference-domain knowledge specified, a knowledge model for e-Tourism Curriculum Plan is set up. The knowledge model showed in the

figure bellowed, is easy for experts to explicate, validate knowledge add new knowledge in graphical form. It is also important for the knowledge system since it helps knowledge users get access to the body of knowledge about the task without reading a lot of materials.
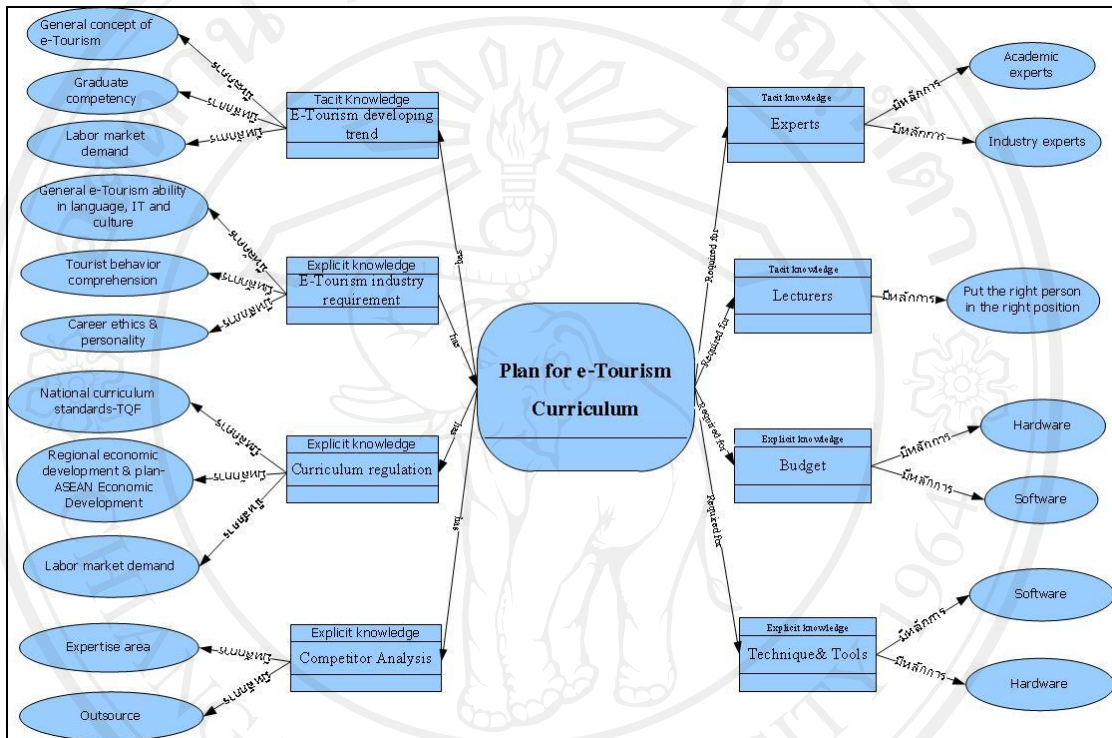

Figure 4.4 Knowledge model for e-Tourism curriculum plan

4.3 KMS Design and Development

After constructed the knowledge model which was the most important part of KMS contents, the next stage is to set up the system. Since the knowledge model was imbedded in the system, how to design a system to facilitate the KMS user to use the knowledge model is a vital issue for the whole research. During this KMS design and development process, user requirements were captured by questionnaires. The main objective of this is to understand and visualize the user requirements of the system. This generates the graphical view of functions of the KMS. At the same time of

obtaining the user requirements, ISO12207 was adopted as a software process reference model to standardize the software development.

The result of questionnaire on user requirements is summarized as following (see Table 4.2). In the first part about KMS features, documents sharing, discussion forum, information about e-Tourism including pictures and videos, and links with other e-Tourism websites are the main features which the persons interviewed are preferred. Then about what kind of user should be invited to join this KMS, the results are consisted with the predicted users in the Chapter 3. The next about the business of KMS, the most of the results were focused on making this KMS as e-Tourism database with rich information; knowledge sharing and communication place on e-Tourism and a helpful system for e-Tourism research works. Some other suggestions were also obtained in the interviews.

Table 4.2 User requirements analysis

Questions	Results analysis
Q1.What features do you want the KMS to have?	Documents sharing, discussion forum, e-Tourism information, pictures, videos, links with other e-Tourism websites
Q2.Who would you want to invite to join this KMS?	Tourism related students, lecturers, curriculum designers, industry experts

Table 4.2 User requirements analysis (Continued)

Questions	Results analysis
Q3.What would you recommend this KMS to work on?	e-Tourism database with rich information, knowledge sharing and communication, student applicants communicate with industry job hunters, e-Tourism research work
Q4.Others? (Suggestions for KMS development)	User manual and Grouping Contents

4.3.1 Software Requirement Specifications

Since the knowledge model was set up in the first stage, this stage is to convey the knowledge model from previous levels to the implementation level. System requirements and specifications are elicited for this knowledge system.

1) Business Specification

BS-1 An international undergraduate and master program in e-Tourism (lectures, e-learning, distant education, international co-research project/workshop, seminar, forum, IS) in CMU and CDU

BS-2 e-Tourism research

BS-3 e-Tourism practice and activities worldwide

BS-4 Tourism software and database design for SMEs in Chiang Mai and Chengdu

2) User Specification

US-1 Curriculum designers, including strategic, executive, academic level, experts, strategic alliance (industry professionals, inside and outside the university, social network)

US-2 Lecturers, including full-time lecturers, guest lecturers, visiting professors from e-tourism relevant area (IT, e-business, tourism and hospitality, Creative Arts, Languages, Cross Culture)

US-3 Researchers, including masters, PhD candidates, PhDs, and full-researchers in CDU and CMU

US-4 Undergraduates, graduates and alumni, including entrepreneurs and knowledge workers

US-5 Industrial professionals

3) System Specification

SS-1 Hardware Specification (Operating system, Hard disk etc.)

SS-2 Network Specification (Wired network and domain controller service)

SS-3 Software Specification (Server Specification-SharePoint2010, Microsoft internet)

SS-4 Client Specification (Explorer, Microsoft Office Visio2010, Microsoft Office 2010)

4) Requirement Specification

RS-1 Any other e-tourism/tourism/e-commerce/web marketing curriculum

RS-2 Curriculum Revisions/Document

RS-3 Knowledge from Teaching Lecturers

RS-4 Knowledge from University Research

RS-5 Knowledge from Industrial Experts

RS-6 Knowledge Model for Curriculum Design by Knowledge Capture

RS-7 Repository Knowledge

RS-8 Expert Lists

5) Functional Specification

FS-1 Search

FS-2 User Control

FS-3 Sites

FS-3.1 Home

FS-3.2 Shared Site

FS-4 Lists

FS-4.1 Communication (Calendar)

FS-4.2 Knowledge Base (Document Library, Contact, Portal)

FS-5 Web Parts / Conceptual Diagram/ Knowledge Map/ Web Database

6) Design Specification

DS-1 KMS Site Structure (Site Map)

DS-2 Data Structure (Some Custom Lists)

DS-3Knowledge Structure (KADS: Task Taxonomy, Inference and Domain Concepts)

7) Test Specification

TS-1 User Test (User Specification)

4.3.2   KMS architecture

After specified all the system requirements, then how to implement these requirements into the system is the key issue in the process of KMS design. The next part is to show the requirements implementation in the KMS.

4.3.2.1 KMS based on business specification

BS-1 An international undergraduate and master program in e-Tourism (lectures, e-learning, distant education, international co-research project/workshop, seminar, forum, IS) in CMU and CDU

Figure 4.5 KMS for e-Tourism education

The KMS is based on the dynamic design framework. The purpose is to provide e-tourism members virtual space to communicate, use, share, and disseminate information and knowledge. SharePoint 2010 is used as the collaborative platform while discussion board, and search tools are used to support. However, for those users who rarely access the internet, e-mail is also applied as they are basic communication tools used broadly. The first homepage of website gives the general view of e-Tourism Curriculum Development information for all types of people.

BS-2 e-Tourism research

Figure4.6 e-Tourism research site in KMS

BS-3 e-Tourism practice and activities worldwide

Figure4.7 e-Tourism worldwide events in KMS

4.3.2.2 KMS based on user specification

Figure4.8 User log-in

For those members who want to participate in the community network, registration process is required for the system to get username and password.
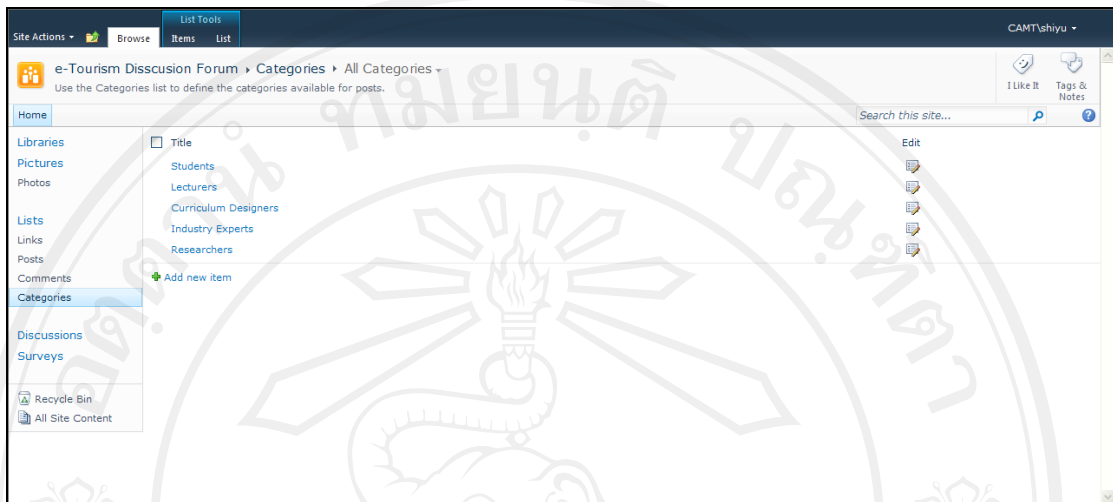

Figure4.9 Five user groups in KMS
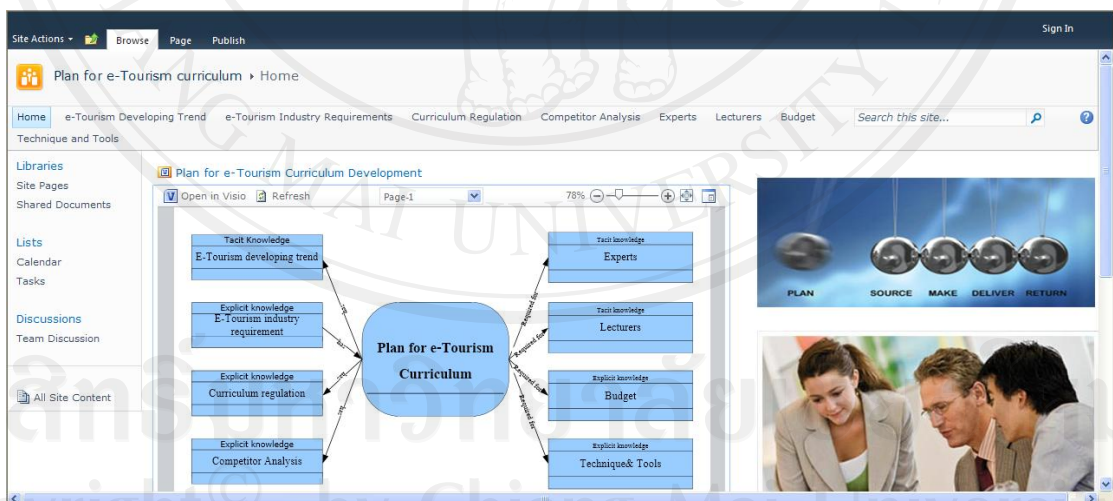
4.3.2.3 KMS based on requirement specification

Figure4.10 knowledge map in KMS

In this KMS, knowledge map is visualized with its control panel. Control panel allows the user to zoom in/out, position map, etc. Microsoft Visio is used for

knowledge map. The users can open this knowledge map in Visio or can edit the knowledge map according to user's right. The control panel section allows readers to rearrange the map style, zoom in/out, or enable the edit mode of the map.

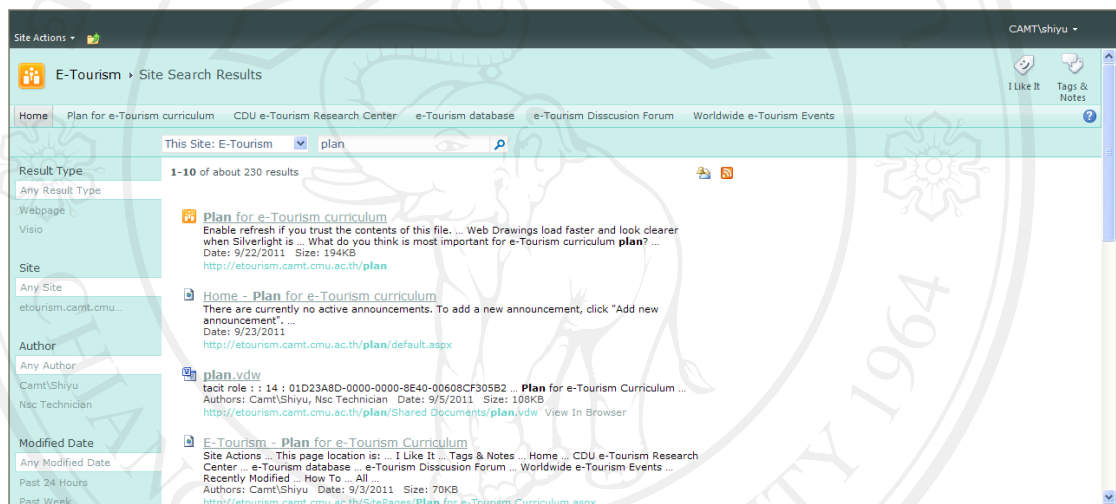### 4.3.2.4 KMS based on functional specification

FS-1 Search tool

Figure4.11 Search function in KMS

FS-2 User Control

Figure4.12 user control in KMS

73

As different types of users require different information and relate with different activities in the business process, user segmentation should be carried out in this system. The system gives user the right and authority to grant or reject members engaging his or her network community. By this way, communication and knowledge sharing in community is enhanced since the information is shared based on the concept of same interest.

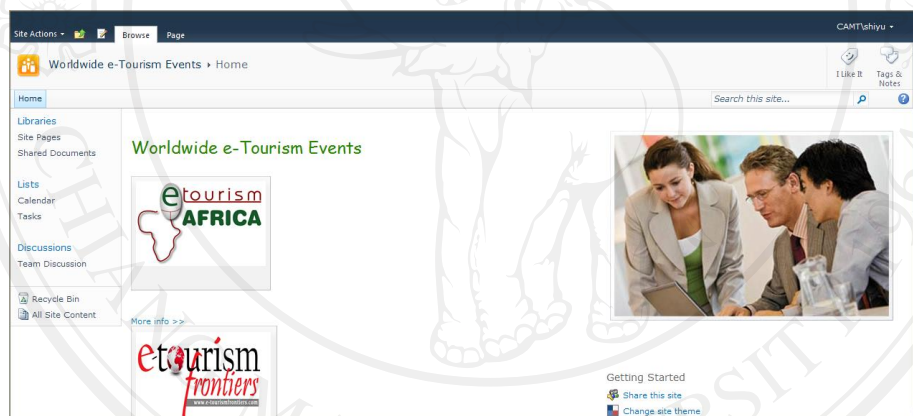FS-3 Sites

FS-3.2 Shared Site

Figure4.13 worldwide e-Tourism Events subsite in KMS

FS-4 Lists
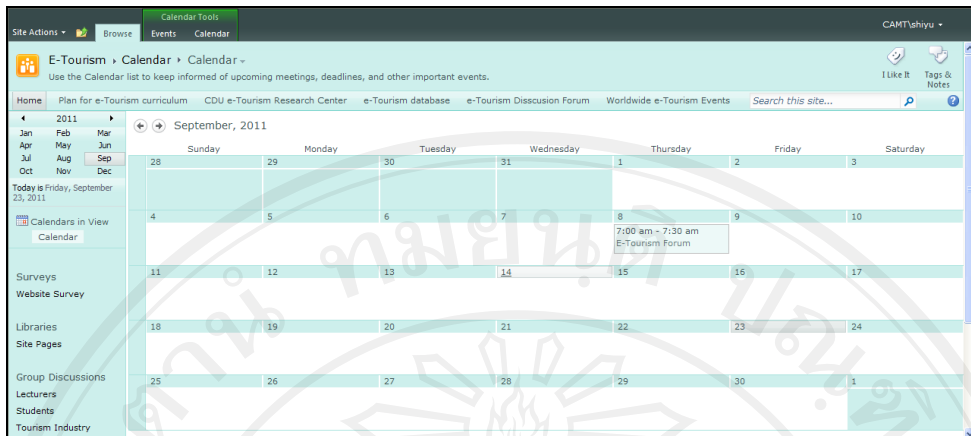
FS-4.1 Communication (Calendar)

Figure4.14 Calendar in KMS

The system also allows users to add events into the business calendar for either public or their own social network. Information activities can be updated or deleted after it has been posted.

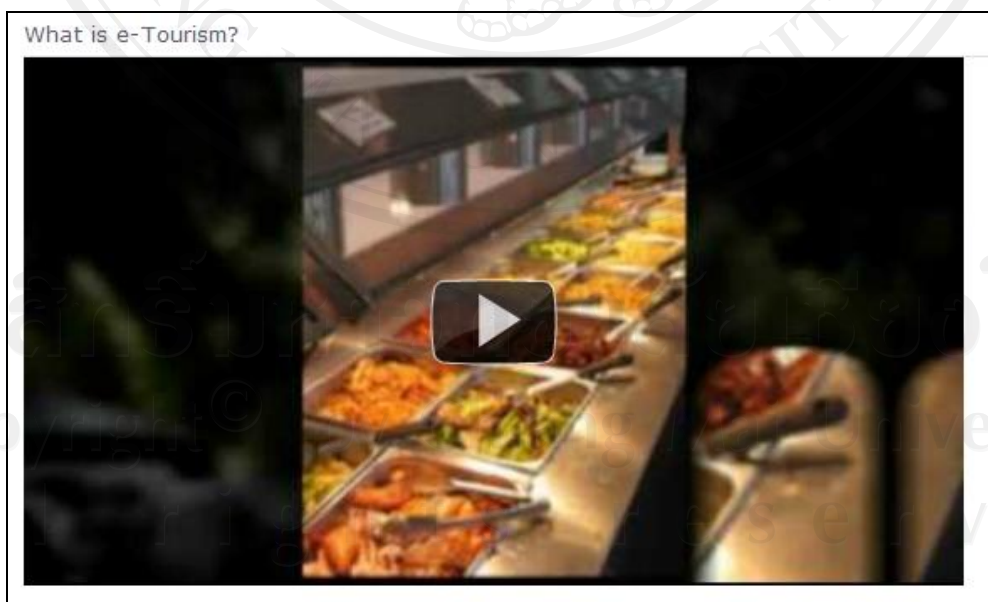FS-5 Web Parts / Conceptual Diagram/ Knowledge Map/ Web Database
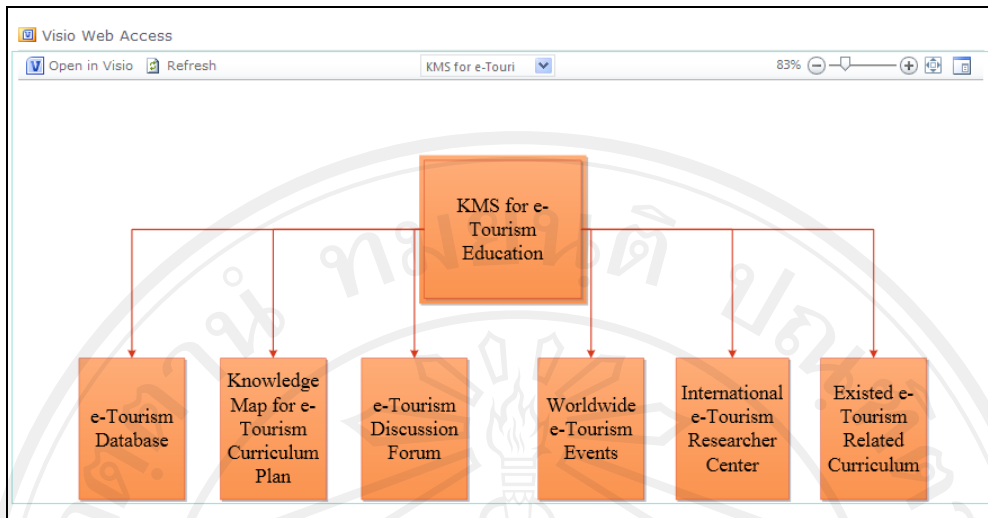

Figure4.15 e-Tourism Videos in KMS

Figure4.16 Concept map of KMS

4.4 Knowledge Creation Processes

And in the KMS architecture, the knowledge service aims at supporting knowledge creation. The Knowledge Management System should support knowledge management activities of this e-Tourism curriculum development project. And the key point of these activities is to transfer the knowledge from experts to the knowledge users at the right place and right time. In order to improve these activities, the role of KMS and technology which support the activity were considered (see Table 4.4).

Table4.4 KMS supporting for SECI model processes

The SECI model processes	KMS support actions
Socialization	e-Tourism discussion forum,
Externalization	Shared document by upload or edit Team discussion,
Combination	e-Tourism database, Edit shared documents
Internalization	After access to this KMS, the users can get explicit knowledge from knowledge map, shared documents, discussion forum, and then user can make the explicit knowledge into tacit knowledge by user themselves.

4.5 KMS User Satisfaction Evaluation

The proposed KMS is applied to e-Tourism curriculum development in Chiang Mai University of Thailand and Chengdu University in order to shorten the knowledge gap between e-Tourism industry and Tourism Education. This step is to evaluate KMS which is an essential part for software engineering process. After we constructed the knowledge system, this evaluation step is to guarantee that the developed system matches the software specification and user requirements.

In this process the test specification which was designed in the design level is used for assessing the functional ability of the proposed KMS. The user requirement

is tested by the means of KMS representation and questionnaire. Our knowledge system is introduced to the e-tourism research center in Chengdu University and e-tourism lectures in College of Arts, Media and Technology for testing. A questionnaire was designed to focuses on the dynamic functions of KMS and to get feedback from the specific types of users. Totally 12 person were interviewed for answering this questionnaire. From the interview results (see Table 4.5), we can see that the first question about easy access to the KMS was scored 4 points which means it is easy to access into the website. And the next question: how do you think about the website design, 8 in 12 (66.7%) people gave average to this question, which mean the KMS design just got average level. Then next, the function of KMS, a better score than the previous one was given to this question. The average value of 3.5 made this KMS function get good level. The last evaluation part is about the operational convenience on KMS. Half of interviewees thought it is average on operational convenient; and 5 interviewees are satisfied with this, so average value of this question is 3.58, which means it is quite convenience to operate this KMS for them. As a conclusion, the KMS evaluated by four aspects, got three good evaluations separately in easy access, website function and operate convenience, while on the website design part, it just got average level.

Table4.5 Results of user satisfaction on KMS

QUESTIONS	RESULTS					AVERGAE VALUE (MEANING)
	Excellent	Good	Average	Poor	Very poor	
	Amount (%)	Amount (%)	Amount (%)	Amount (%)	Amount (%)	
Is it easy to access into the website?	1 (8.3%)	10 (83.3%)	1 (8.3)	0	0	4 (Good)
How do you think about the website design?	1 (8.3%)	3 (25%)	8 (66.7%)	0	0	3.42 (Average)
How do you think about the function of the website?	1 (8.3%)	4 (33.3%)	7 (58%)	0	0	3.5 (Good)
Is it convenience for you to operate this website?	1 (8.3%)	5 (41.7)	6 (50%)	0	0	3.58 (Good)

78