DESIGN OF ADAPTIVE KNOWLEDGE LEARNING AND MANAGEMENT SYSTEM FOR LARGE FOOD AND BEVERAGE INDUSTRY BASED ON SHARING AND DISCUSSION TECHNIQUE

[1] CHEN-FENG WU, [2] CHENG-I HOU

[1]Asstt Prof., Department of Information Management, Yu Da University

[2]Assoc. Prof., Department of Leisure Management, Yu Da University

E-mail: cfwu@ydu.edu.tw, cheng@ydu.edu.tw

ABSTRACT

E-Learning is a new way of learning which is caused by the flourishing development of computer and electronic information technology. The teaching and learning are not to be limited by space and time through the Internet. Besides, they can develop the flexibility and popularity of interactive teaching. By the digital records of e-Learning and assessment in the computer information system, managers could effectively handle learning results of the learners, and combine the results with the development of human resource and the financial operation system, to achieve the effective enterprise resources integration.

In recent decades, the rapid development of information technology causes that large food and beverage enterprises take information technology into supporting internal operating procedures. However, effective utilization of technological resources within an organization is limited. To face the pressure of business competition and globalization, enterprises have been engaging in the activities of Knowledge Management, and actively exploring that how to promote knowledge management within the company, through which way to create a competitive advantage by knowledge management. However, the knowledge sharing is an important core issue of knowledge management. In other words, knowledge management decides if it would success or failure. This paper would try to build an e-learning system of adaptive learning within an organization. Moreover, it would help employees learning development and effective use of corporate resources and also to be helpful for the expectations of the business organization strategic development.

This paper takes enterprise into the research object and helps them to establish the adaptive e-Learning System. We expect this system would improve substantial benefit of the human resources management and development, Planning of Decision Support System. It also improves the effective planning of human resources, to match employees career planning with corporate. Employees could learn knowledge via e-learning management system, an effective solution to multinational staff of vocational training and time-consuming and cost issues.

Keywords: *E-Learning, Adaptive Learning, Knowledge Share*

1. INTRODUCTION

U.S. Restaurant Business magazine has studied the use of information systems catering situation. The study found that the use of the computer industry is the scope of accounts receivable and employee payroll, menu analysis, inventory control, catering services, employee work schedules, instruments, forms of production and processing, kitchen production, as well as the printed menu. According to the study of statistical analysis, large restaurants and particularly in tourist hotels inside the attached restaurant, is almost entirely dependent on computers to handle these matters.

E-Learning is through computer and electronic information dissemination and access to knowledge of the learning. The two sides will not be limited to the teaching time and place into the conduct classes. This would make progress of time to adapt their teaching and give full play interactive teaching flexibility [1]. Traditionally, education in the internal organization of planning training must

gather all of the employees at the same place and time to attend classes. It generates the high cost of business scheduling troubles. If we use e-learning can be flexible scheduling, and festival provincial cost, reserves the learning process in the computer system, enabling management to master each of those learning. Human resources can combine the learning operation with integration of financial system. This can assess the effectiveness of learning to achieve effective enterprise resource integration [2-3].

Real-time networks change the way of people communication. Network users may have common interest, experience or needs, through a network virtual space, interactive discussion, sharing of information, experience, knowledge and emotional exchange, and thus form a "virtual community" [4]. No mater of any types of virtual communities have encountered to some extent to meet the users to seek knowledge, develop relationships, fantasy, and transaction and other demand [5]. Information to actively participating in making consumers and businesses interact and become the real basis for value creation. In other words, participating in a virtual community of consumers to purchase goods when the value obtained that contains a virtual community through the values obtained. This can see a virtual community whereby an individual exercises has not been overlooked.

E-Learning system contains the entire learning environment, such as learning and learning discussion, study records, assessment systems, etc. A good and comfortable e-Learning system can be appropriate to improve the quality of courses and allow learners to achieve learning objectives [6-8]. Traditional marking exam papers would be very troublesome. The use of e-Learning system can reduce teachers marking time. Students can be immediately aware of their test results. Real-time adjustment of learning, teachers can more quickly understand the students learning outcomes. Effectively grasping the learning conditions, there are so as to adjust instruction [9-10].

In recent decades, the rapid development of information technology causes that enterprises take information technology into supporting internal operating procedures. To face the pressure of business competition and globalization, enterprises have been engaging in the activities of Knowledge Management, and actively exploring that how to promote knowledge management within the company, through which way to create a competitive advantage by knowledge management [11].

Many domestic enterprises faced with industrial competition and globalization pressure with starting engaged activity in the knowledge management and discussing the company internal knowledge management positively and penetrating each way to carry on the knowledge management. Try to create the competitive advantages [12], general knowledge management flow includes seven activities: The creation, the definition, gathering, uses, the organization, the utilization, and stages and so on [13]. The implementation of knowledge sharing (KS) is the most difficult [14]. In practice, knowledge sharing is the core issues of knowledge management. In other words, the success or failure of the implementation of knowledge management is still the most important knowledge sharing.

The purpose of this study was to enable employees to learn from the knowledge-sharing system. Using the system has a better understanding of knowledge sharing and has knowledge of the organization through the Internet without having to spend too much time online to find information. Reducing unnecessary expenditures of time can achieve maximum effect. By the present analysis summarized a staff model of knowledge-sharing preferences. The establishment of an information system is knowledge sharing relatively. The Web 2.0 was adopted as a base to develop a customized knowledge of online learning management system platform, and it lets the knowledge manager or user achieve knowledge sharing, re-use, innovation and enhance efficiency. Effectively knowledge-holders of the knowledge "externalization" and knowledge sharing and knowledge need as those who "internalized."

The Web 2.0 was taken as a base to develop a customized knowledge of online learning management system platform, and the proposed system can improve enterprise's real-time learning and real-time sharing of knowledge time efficiency.

2. LITERATURE REVIEW
2.1. Knowledge management

In general, knowledge management should focus on the following eight key areas: (1) view, develop, maintain and protect corporate knowledge sources; (2) promote personal knowledge innovation; (3) determine the knowledge to be executive work; (4) modify and adjust the enterprises to make effective use of knowledge; (5) creation, knowledge management and monitoring activities and

strategies; (6) protecting proprietary and competitive knowledge and control knowledge access; (7) provide knowledge management capability and infrastructure to facilitate and support knowledge management action; (8) quantify and descriptions of all knowledge asset performance.

The knowledge management process has many names, such as knowledge management life cycle, knowledge management recycling and so on. In this study, the knowledge management processes related to a series of sequential combination of processes is called knowledge management processes. In a knowledge-management processes a specific process, and there are a different division. More typical of knowledge management process includes four parts: the creation, access, transfer and application according to this framework analysis of the knowledge management system in the organization's role [15-16].

Knowledge discovery [17] can be defined as through the data, messages or prior knowledge of the comprehensive discovery of new explicit and tacit knowledge, and features include an integrated and grouping of knowledge. Integrative aspects of knowledge can be used by methods which include databases, web-based data access, digital mining, Web Portal, best practices and so on. With regard to grouping, you can use video conferencing, electronic discussion forum and E-mail technologies.

Reading knowledge exists in people, organizational entities attached to objects and implicit and explicit knowledge [18], and it includes the knowledge to outside of recessive to dominant and dominant to the recessive internalization [19]. Externalization need for expert systems, forums, best practices, such as technical support, and internalization requires communication technologies, AI and simulation techniques.

Knowledge sharing is the explicit knowledge and tacit knowledge exchange with others, including the grouping and exchange of both functions. Grouping the same technology and knowledge discovery, exchange of technology include the coordination of the group tools, web-based data access, database, best practices and expert positioning systems.

Application of knowledge has two aspects: the instructions and routine. Instruction is to have knowledge of instructions given to the acts of others, but not the transfer of instructions behind the knowledge. Routines are often referring to the use of procedure, rules, and norms of knowledge to guide future behavior. Instruction requires the following technologies and they are capture of expert knowledge and transfer of case-based reasoning systems and decision support system. Routine technical requirements include expert systems, enterprise resource planning systems, and management information systems.

2.2. Members of the Enterprise Knowledge Management Model

Members of the enterprise knowledge management model constitute a virtual enterprise knowledge management model basis. Members of the enterprise knowledge management model can operate independently and with other members of the enterprise knowledge management system work together.

The system theory point of view, based on the above-mentioned members of the constituent elements of corporate knowledge managers, each subsystem, a variety of activities and knowledge of the complex interaction between analysis and synthesis, can be members of the enterprise architecture knowledge management system, shown in Fig. 1 as follows:
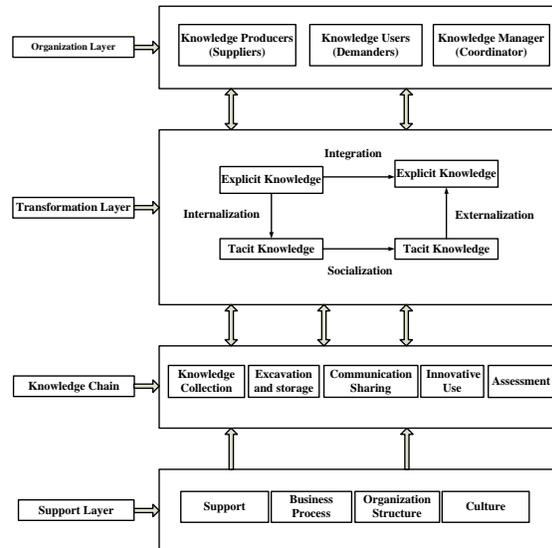

Fig. 1 Members of the Enterprise Knowledge Management Model

Members of the enterprise knowledge management framework consist of four sub-components: knowledge management organization layer, knowledge management active layer, knowledge value chain and knowledge transfer layer and knowledge management support layer.

2.3. Virtual enterprise extranet knowledge management model

Virtual Enterprise needs to be an integrated global perspective in all fields of knowledge. The knowledge management could adjust the various members of the business knowledge database to solve operational problems. Therefore, all members need to build a platform to achieve the exchange of knowledge and learn from each other. In order to create a learning interactive virtual organizational structure, the construction of a virtual enterprise knowledge management model is shown in Fig. 2:
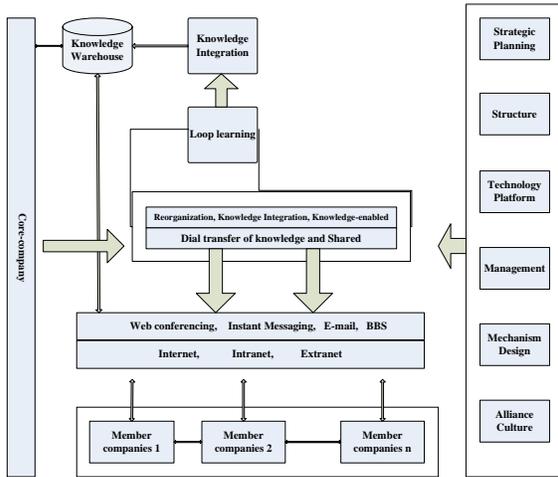
Fig. 2 Management Model of Virtual Enterprise Network

2.4. Web 2.0

Web 2.0 is made by O'Reilly Media, and held a conference in 2004 and 2005, respectively. There are many concepts and purposes shown as follows:

- Hope that through the browser can conveniently to handle all matters, that is, the Web as a service platform.

- Active flow of information is done by the web site to the user's browser, but not a user on the various websites.

- Users can customize the information.

- Emphasize the use of Web-interactive, that is, the users participating and sharing, and social software development.

- User-centered.

Technically: the use of the following technology can be referred to as Web 2.0 sites.

- CSS, semantically valid XHTML markup, and Microformats.

- Unobtrusive Rich Application techniques (such as Ajax).

- RSS/Atom.

- Support posting to a weblog.

- REST or XML Web service APIs.

- Some social networking aspects.

2.5. Adaptive technology

Web site provides too much links and information that user could easily lead to disorientation. Many studies have various adaptation methods which can provide users with personalized navigation structure. The so-called adaptive Web-based website is based on the user browsing behavior to be able to automatically improve the site's organizational structure and presentation. That is, sites could use browsing information, such as residence time, visit frequency, and automatically adjust the content of the website to meet the user's personal characteristics. The website is able to provide personal characteristics, that is, adaptive-oriented Web site. Site requires adjustment may be four reasons: (1) Different users have different views and objectives. (2) even if the same user at different time may have different needs. (3) Site growth and evolution over time, their original site design may become inappropriate. (4) Site may be designed for a particular purpose, but the user does not follow that purpose to use the site.

3. METHODOLOGY

In this study, Systems Development Life Cycle (SDLC) as a research core, its methods and steps described as follows in Fig. 3:
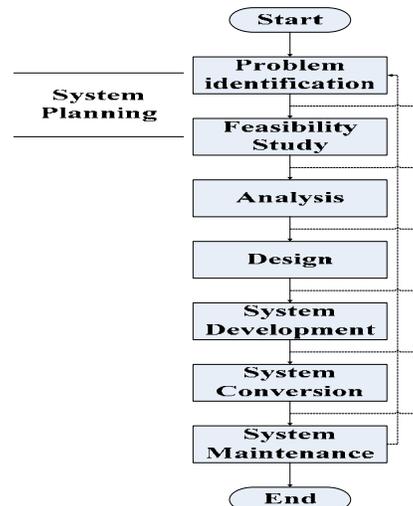

Fig. 3 Research Flowchart

3.1. Problem identification

The problem identification would understand the establishment of knowledge-sharing and discussion of learning management system requirements of the necessary conditions and needs through the internal and external research first. By jointing venture co-ordination and assistance as well as visiting the catering system processes, they can make this study have a deeper understanding of the food industry, so that the design of the new system can be closer to the information needs of the catering industry.

3.2. Feasibility Study : This study first aimed at the economic and operational feasibility studies to determine the feasibility analysis.

(1) Economic viability: this study adopted Return On Investment (ROI) method and the Payback Period Method (PPM) to confirm this with the catering management information system for business viability. The methods described as follows:

A. Return On Investment（ROI）

$$ROI = （P - C / N）/（C / 2）$$

P - after-tax profit; N - investment life; C - investment amount; Calculated ROI is usually lower than market interest rates, then the investment is worthy.

B. Payback Period Method（PPM）

$$PPM = C / P$$

C - investment amount; P - recovery amount; Calculated PPM that is the shorter the length of payback, the investment is worthier.

(2) Operational viability: This part of the focus of the study is to analyze the solution proposed by project is feasible. Users of the system acceptance is also one of the items must be analyzed, including the restaurant manager or employees, and network customers are users of the system. Strengths and weaknesses affecting the user to judge the factors of, system, such as a beautiful screen that is easy to use, and so on, and then could be the reference for the establishment of Internet service system.

3.3. Analysis

The study converts user requirements specification for the logic design through data collection techniques, data dictionary, data flow diagrams, process specifications, data modules, system modules and system flow charts and so on, to make the logical design specifications and detailed description of the problem, and to analyze the various options and decided the best option.

3.4. Design

In the beginning of the systematic analysis, the establishment of three functional modules that consists of three modules, as shown in Fig. 4 is proposed in this paper after the in-depth discussions with the company.
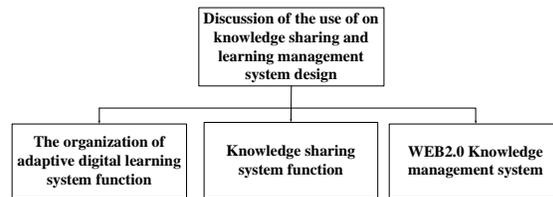

Fig. 4 Three main functional modules

(1) The organization of adaptive digital learning system functions is proposed as shown in Fig. 5:
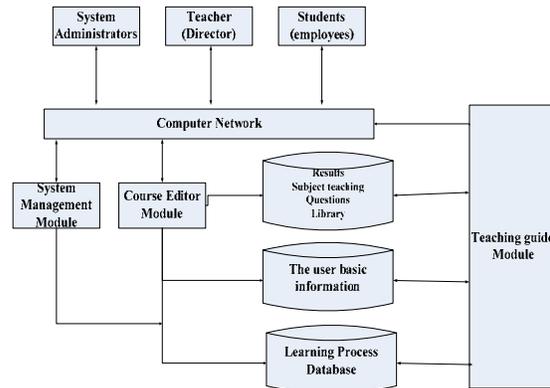

Fig. 5 Organization of adaptive digital learning system function

Main functions of the system of Fig. 5 are classified as follows:

A Bulletin board and discussion: System management can provide the latest news release and maintenance. The students can open discussion area to ask questions and participate online discussions. Teachers can also learn through the discussion area to understand the user's situation.

B. Adaptive Learning Management: Users can browse through the courses learning guide. Learning histories can also be viewed for their own learning conditions, and these include learning total time, frequency and operating situation.

C. Materials management: Teachers can access the teaching material database and maintenance the course content.

D. Course management: Teachers can establish the curriculum framework and teaching strategy as well as enable the online learning based on this teaching strategy.

E. Basic data management: System administrator can control the user accounts and permissions. Online editing menu is also provided. The user learning history can be queried.

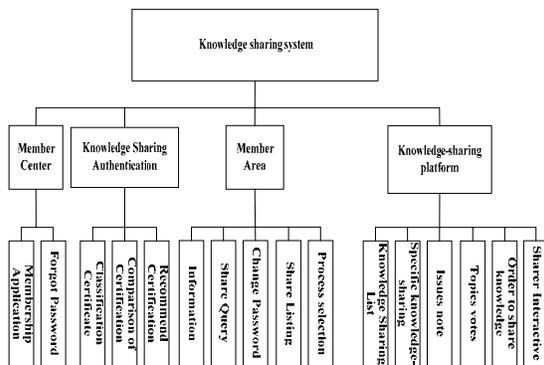(2) Knowledge sharing system function is proposed as shown in Fig. 6:

Fig. 6 Structure of knowledge sharing system function

Main functions of the system are classified as follows:

A. Knowledge Reservation System: User can browse through the knowledge sharing system and make the selections of the knowledge.

B. Message System: Any comments or advice for the knowledge sharing can be interacting with others using this system.

C. Knowledge Sharing Authentication: The new knowledge and recommendation can be sent from the network to improve work efficiency.

D. Knowledge-sharing platform

(I) Registration System: User with registration system.

(II) Specific knowledge sharing: Launched a specific topic knowledge-sharing, in order to increase the number of specific knowledge-sharing.

(III) Knowledge-sharing list: Display all the knowledge sharing categories and their associated topic.

(IV) Search process: The staff is more convenient to do queries.

(V) Problem description: Publishing frequent ask question in the website.

(VI) Knowledge Search: According to input keywords to search for the relative knowledge.

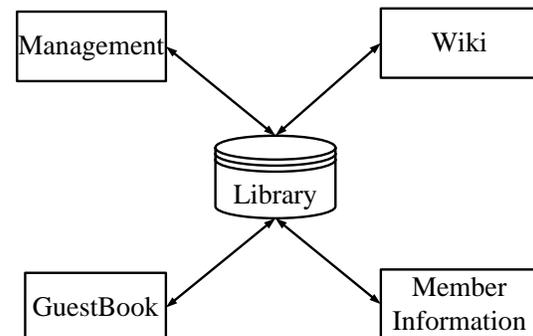(3) WEB2.0 Knowledge management system is proposed as shown in Fig. 7:

Fig. 7 WEB2.0 knowledge management system design

Main functions of the system are classified as follows:

A. Management

(I) Account Management

Staff Information Inquiry: Check the staff information to facilitate Web site management.

Account Management: Maintenance of manager accounts, permissions distinction.

Change of login password: Changing password, or changing after the completion of re-login.

(II) Knowledge Management

Data maintenance: Knowledge categories and inter-departmental information for inserting, modifying or deleting.

Search knowledge management systems: Maintenance of staff information inquiries. (Including knowledge processing progress)

(III) Category Management

Knowledge Category Management: Categories can be added to serve as the main basis for classification of knowledge management.

(IV) System Management

Announcement Management: Release, modify and delete the system notice.

Message Management: Response and manage the message content to strengthen the system instantaneous nature.

Problems Management: Can add, modify and delete the problem description.

System Logout: Managers don't conduct system maintenance that needs to log off in order to increase security.

B. Member System:

(I) Basic information: Name, phone, mail, address and other basic information maintenance.

(II) Knowledge Sharing Information: Personal learning materials query. (Including the progress inquiries)

(III) Knowledge Sharing: Integration of various departments to share knowledge, the contents of the directory.

(IV) Knowledge List: Booking for detailed information view of knowledge.

(V) Password changes: Login password changes.

C. Message System:

(I) Can express their views on knowledge.

(II) Can send messages to the author.

D. Wiki System:

(I) Edit mode: Can edit the selected articles to add, delete, save.

(II) Specific knowledge sharing: Planning a specific project launched a specific knowledge-sharing to increase the number of specific knowledge-sharings.

(III) Registration System: Adding members, providing the user registration system.

(IV) Knowledge Search: According to input keywords to search for the relative knowledge.

3.5. System Development

A detailed understanding of business requirements can help to sum up enterprises to build the system requirements of knowledge-learning management. Therefore, this study used prototype method, using XOOPS for development

planning to establish the knowledge management module. The purpose of this section is that they confirm the feasibility of this system, integrity and applicability. So that for the business more clearly understands this system function and whether the use of future demands is meet the enterprise requirements or not.

This study adopted the XOOPS, ASP.net and Ajax compiled program to develop the proposed system. Integration of each functional module is completed through the testing process to confirm the validity of the system. The prototype of the system shown in Fig. 8 to Fig. 13:
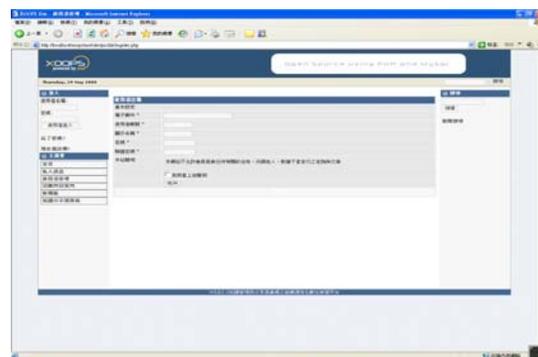

Fig. 8 Member Registration Module

Member Registration module provides registered users to use Wiki, forums etc., and to publish articles or reply.
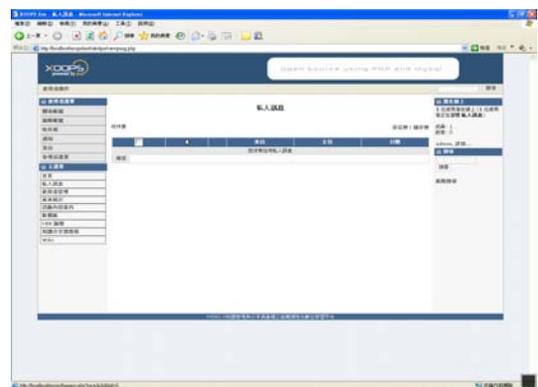

Fig. 9 Private Message Module

Private Message module to provide members to send instant messages to the article author, administrator, or other registered users.

Fig. 10 Project Module

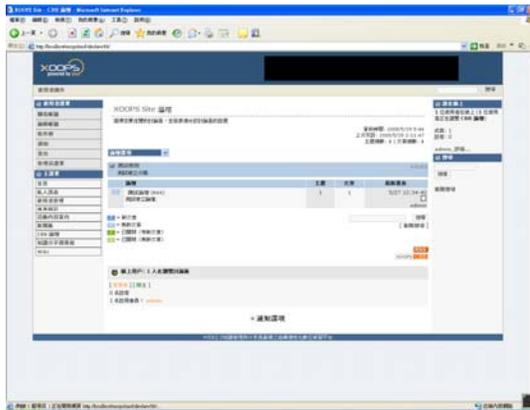The project module provides the user with the development of new projects.

Fig. 11 Forum Module

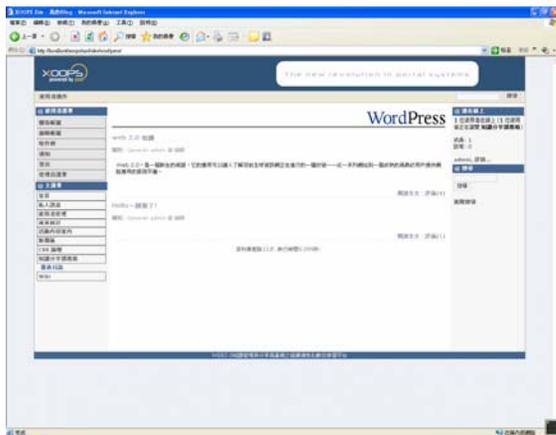Forum module provides knowledge sharing and discussions.

Fig. 12 Blog

Blog is a source of knowledge sharing can share their personal knowledge and experience.

Fig. 13 Wiki

The WiKi module provides functionality similar to the Wikipedia features to query knowledge and participation in knowledge editing and recommendation.

3.6. System Conversion and Maintenance

(1) System Conversion

Let knowledge learning management system be used for the catering industry practitioners. In this study, the cooperation business does not have any experience in the information system of knowledge management of food and beverage, so, staff education and training must be executed. After negotiations with the employees, the task of this step is to plan the required server-related software to implement on the server.

(2) Maintenance

The main task of maintenance aims at maintaining the correction and perfection for the information system of restaurant knowledge learning management.

4. CONCLUSION

Large chain restaurant industry often locates in many different places or countries. Therefore, the complexity of staff training will occur. Particularly, if the staff is in the different countries, the staff training made very time-consuming and difficult. This study aims at building a knowledge sharing and adaptive learning management system for the large chain restaurant industry. This research has mainly the following three technologies: adaptive learning, knowledge sharing and Web 2.0 and so on. The adoption of Web 2.0 technology helps to construct knowledge management platform effectively in this paper. The proposed learning management system of knowledge could reduce training costs, effectively reduce the operating costs,

reduce the training time of staff and improve employee willingness to learn. The system allows managers easily understand the situations of staff learning and learning effectiveness, so that can be quickly deployed.

In this study, a systematic classification, and establishment of adaptive learning environment for the individual learning needs which are related to business process for a large restaurant industry are proposed in this paper. The proposed system can provide cross-country workers flexible study time and place to substantially reduce the training time and money.

ACKNOWLEDGMENT

REFRENCES:

[1] U.M. Krause, R. Stark and H. Mandl, "The effects of cooperative learning and feedback on e-learning in statistics", Learning and Instruction, Vol. 19, No. 2, April 2009, pp. 158-170.

[2] C.P. Eva and G. Chryssi, , "Asset pricing with adaptive learning", Review of Economic Dynamics, Vol. 11, No. 3, July 2008, pp. 629-651.

[3] A.M. Payne, J.E. Stephenson, W.B. Morris, H.G., Tempest, A. Mileham and D.K. Griffin, "The use of an e-learning constructivist solution in workplace learning", International Journal of Industrial Ergonomics, Vol. 39, No. 3, May 2009, pp. 548-553.

[4] M.J.J. Lin, S.W. Hung and C.J. Chen, "Fostering the determinants of knowledge sharing in professional virtual communities", Computers in Human Behavior, Vol. 25, No. 4, July 2009, pp. 929-939.

[5] C.K. Prahalad and R. Venkat, "The Future of Competition: Co-Creating Value with Customers", Boston, MA: Harvard Business School Press 2004.

[6] F. Seddon and M. Biasutti, "Evaluating a music e-learning resource: The participants' perspective", Computers & Education, Vol. 53, No. 3, November 2009, pp. 541-549,.

[7] R.J. Kiteley and G. Ormrod, "Towards a team-based, collaborative approach to embedding e-learning within undergraduate nursing programmes", Nurse Education Today, Vol. 29, No. 6, August 2009, pp. 623-629,.

[8] S. Liuzzo and P. Tomei, "A global adaptive learning control for robotic manipulators", Automatica, Vol.44, No. 5, May 2008, pp. 1379-1384,.

[9] H. McVeigh, "Factors influencing the utilisation of e-learning in post-registration nursing students", Nurse Education Today, Vol. 29, No. 1, January 2009, pp. 91-99.

[10] Y.J. Yang and C. Wu, "An attribute-based ant colony system for adaptive learning object recommendation", Expert Systems with Applications, Vol.36, No. 2, Part 2, March 2009, pp. 3034-3047.

[11] B. Dave and L. Koskela, "Collaborative knowledge management—A construction case study", Automation in Construction, Vol. 18, No. 7, November 2009, pp. 894-902.

[12] D. Armitage, M. Marschke and R. Plummer, "Adaptive co-management and the paradox of learning", Global Environmental Change, Vol. 18, No. 1, February 2008, pp. 86-98.

[13] A. Andersen, "Business Consulting Zukai Knowledge Management", Tokyo: Toyo Kenizi. 1999.

[14] R. Ruggles, "The State of the Notion: Knowledge Management in Practice, in: California Management Review", Vol. 40, No.3, Spring 1998, pp 80-89,.

[15] B. Holzner, and J. Marx, "H. Knowledge application: the knowledge system in society", Allyn and Bacon, Inc., 1979.

[16] M. Alavi and D.E. Leidner, "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues", MIS Quarterly, Vol. 25, No. 1, March 2001, pp.117-136.

[17] W. He and K.K. Wei, "What drives continued knowledge sharing? An investigation of knowledge-contribution and -seeking beliefs", Decision Support Systems, Vol. 46, No. 4, March 2009, pp. 826-838.

[18] W. S. Chow and L. S. Chan, "Social network, social trust and shared goals in organizational knowledge sharing", Information & Management, Vol. 45, No. 7, November 2008, pp. 458-465.

[19] G. Pirró, C. Mastroianni and D. Talia, "A framework for distributed knowledge management: Design and implementation", Future Generation Computer Systems, Vol.26, No. 1, January 2010, pp. 38-49.