Knowledge Repository: Implementing Learning Management System into Corporate Environment

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Abstract—**Learning Management System (LMS) refers to the system that provides the delivery, assessment and management tools for an organization to handle its knowledge repository. However, learning environment model between corporate and academic environment is significantly different. Academic environment focuses on students' achievement and never meant to retain them while in a corporate environment focuses on knowledge sharing among employees and a way to retain them. The growth of Knowledge Economy has transformed human capital to be the vital asset in business organization of the 21st century. Arguably, due to its white-collar nature, knowledge-based industry is more favorable than traditional manufacturing business. However, over dependency on human capital can also be a major challenge as any workers will inevitably leave the company or retire. This situation will possibly create knowledge gap that may impact business continuity of the enterprise. Knowledge retention in the corporate environment has been of many research interests. By using the aspirations of a proven LMS implemented in an academic environment, this paper proposes LMS model that can be used to enable peer-to-peer knowledge capture and sharing in the knowledge-based organization and also minimize the impact of staff turnover. Cloud Enterprise Resource Planning (ERP), referred to an ERP solution in the internet cloud environment was chosen as the domain knowledge. The complexity of the Cloud ERP business and its knowledge make it very vulnerable to the knowledge retention problem. This paper discusses how the company's essential knowledge can be retained using the LMS system derived from academic environment into the corporate model.**

Index Terms—**Cloud ERP; Knowledge Repository; Knowledge Retention; Learning Management System**

I. INTRODUCTION

Knowledge based organizations are susceptible to face with knowledge gap scenario whenever an employee leaves the organization. In knowledge-based organizations, the staff holds the knowledge through the training and experience gained while being in employment [1], [2]. While in the manufacturing industry, machineries are the key components to the operation, in knowledge-based industry such as ERP software provider, knowledge workers are the most valuable assets. The cloud-computing environment is generally service oriented architecture model that provides lower cost of ownership to end user by simplifying the hardware, development, deployment and support model. This is a typical service oriented industry that relies on knowledge worker as a driving force. Knowledge retention has always been the company's challenge in order to move ahead. Being a Cloud ERP

provider, not only the company has to retain the accumulated knowledge acquired throughout the operation, it also has to keep up with the incoming new knowledge as technology gets updated. ERP provider also has to deal with multiple area of knowledge such as computer technology as well as business process knowledge such as finance, human resources, supply chain, customer relationship management etc. The amount of knowledge itself makes it difficult to handle, and what if there is a staff turnover? This problem has created research challenge to be addressed. Since knowledge itself is part of academic forte, knowledge transfer from the matured academic model into the company operation model can be a great help to most knowledge based business entities.

Learning Management System (LMS) illustrated in Figure 1 below is a matured system in the academia world to compliment the educational system focus in producing well-rounded students with deep knowledge and understanding of their subject, which includes historical and theoretical foundations. As oppose to the conventional education system, corporate training objective is slightly different with return of investment (ROI) as the key factor in ensuring that the learning capacity within the corporate domain is all about practical applications. This is relevant as in a manufacturing industry it is understood that the machineries are the key operation components, yet in a knowledge-based environment, workers are the major assets.
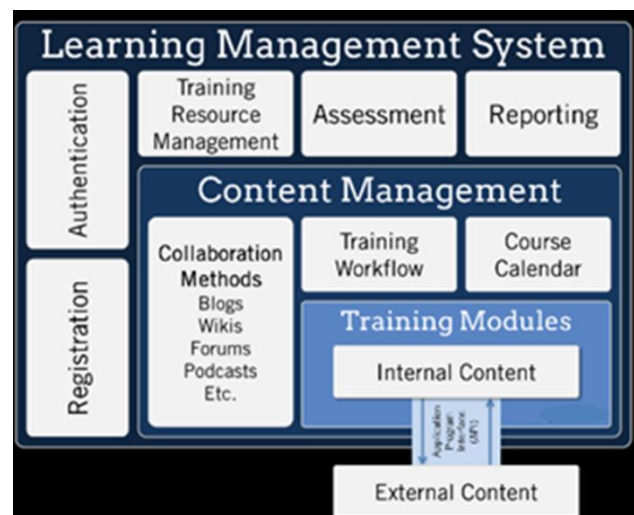

Figure 1: Learning management system overview

Thus, in this paper, by using the aspirations of Learning Management System implemented in the educational

environment, we propose to generate a model of On-Demand Learning model to create a systematic knowledge repository model that can help the company to mitigate the effect of staff turnover and knowledge retention.

II. BACKGROUND OF STUDY

Knowledge-based organizations such as Information Technology (IT) related companies boast the ability to have the right solution for the needs of other organizations. The key factor is to have the right person with the right knowledge to convince customers what is needed. Thus, training these key personnel is an important element to ensure that each staff is well versed in the subject matter at hand. It can be training about software development, skills in IT infrastructure, software coding tips, etc. However, due to the knowledge-rich environment cultivated in these organizations, human capital has become a rare commodity whereby losing a long serving employee results in losing the knowledge which was imparted on the particular employee [3]. For the organization to rehire and retrain from scratch has become a corporate nightmare to a certain extent.

Knowledge Transfer Success Factors (Doan et. Al. (2011):
• Top management support
• Knowledge retention strategy
• Learning culture
• Human Resource (HR) practices (since knowledge resides in people, knowledge retention is closely linked to HR practices including recruitment, education, rewards, and performance management)
• Information and communication technology tools

Figure 2: Knowledge retention strategy

Knowledge Retention is a typical scenario commonly faced by knowledge economy enterprises. Businesses that is dependent on knowledge workers such as in Service oriented businesses are posed with the challenges to retain the knowledge workers in order to continue the businesses. Unfortunately, it is inevitable that at some point in time, the workers will leave the organization and if no transfer of knowledge is done, the business will be in a crisis.

Knowledge retention has been a key issue for knowledge-based organization and is defined as the ability to identify the knowledge resources that are at risk and must be retained, and then implement specific initiatives so as to keep these resources in the organization as illustrated in Figure 2 above. It is part of Knowledge Management study to tackle the issue. On the other hand, one of the products of Knowledge management, Learning Management System (LMS) has long been established within the academic world [4], [5]. Would this be a chance that we can adapt LMS in the corporate industry to minimize the impact of brain drain? Learning Management System (LMS) refers to the system that provides the delivery, assessment and management tools for an organization to handle its knowledge repository [6].

III. CHALLENGES IN CORPORATE ENVIRONMENT

Knowledge based industry such as service oriented business has introduced a set of new problems for the business owners in managing the businesses. Prior to knowledge economy, businesses are heavily reliant on machinery to run the operation. While one of the challenges is how to manage vast amount of knowledge, retaining the knowledge against the staff turnover is another challenging task [1], [7]. A factory is always associated with machinery that helps to produce the physical products. Without the machine, the businesses can't be operated. With knowledge-based industry, the workers now play the role similar to the machine in the factory environment. The dependency of the business on the workers has been a great concern. Business continuity risk has always been a major impact for being over dependent on knowledge workers. In summary, there is a requirement for knowledge management system that can handle vast knowledge repository, knowledge sharing and its retention in the corporate environment.

In searching for a knowledge management system solution, intuitively, we would refer to academic institutions as they have been managing knowledge successfully. LMS has been widely adapted into academic institution as the main software system to handle the knowledge management. The most significant difference between academic and corporate environment is that academic environment focus on students' achievements and never about retaining them whereas corporate environment focus on knowledge sharing among employees and ways to retain the accumulated knowledge [8], [9]. Obviously, literature review reveals a lot of research has been conducted in improving academic LMS, however LMS research in the corporate context such as Cloud ERP production environment is lacking thus justifying the attempt to introduce a corporate LMS model while utilizing the lesson learned from academic LMS model [2].

IV. LEARNING MANAGEMENT SYSTEM IN CORPORATE ENVIRONMENT

Based on the matured LMS model used in academic environment, we are creating an LMS model that suits knowledge based business operations which in this case refers to a Cloud ERP production environment. The key objective of implementation is to create an LMS that is on demand and interactive in nature that will also become the company's knowledge repository. This system will in return be the company's intelligence repository that can support the knowledge retention effort and also reduce the effect of brain drain due to staff turnover. This illustrated diagram as shown in Figure 3 below uses LMS to repository the knowledge into corporate environment.
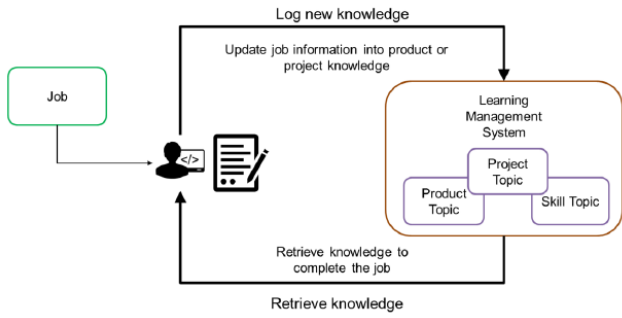
Figure 3: Log knowledge to corporate LMS

The initial step taken was to follow through with a Knowledge Retention Strategy is shown in Figure 4 below where each consideration is taken into account such as Knowledge Transfer Practices, Knowledge Recovery Initiatives, Capturing and Record of Shared Knowledge as well as Human Resources current practices.
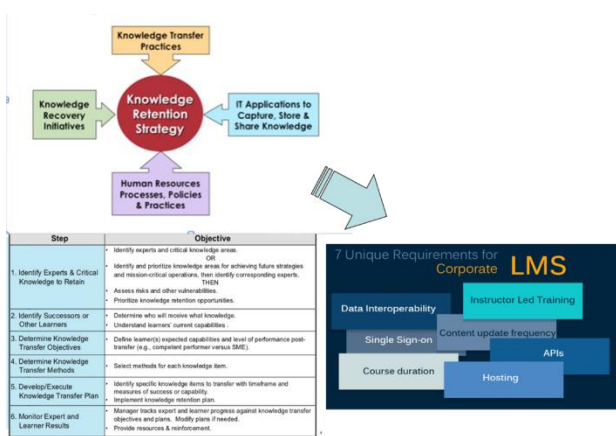

Figure 4: Knowledge retention strategies for requirement finding

A. LMS Knowledge Structure

The company knowledge repository can be explained by the knowledge breakdowns which can later be used to categorize in the LMS.

Figure 5: Knowledge breakdown in a business organization

Figure 5 above shows the knowledge breakdowns which can later be used to categorize in the LMS. Technology knowledge refers to the knowledge with regards to the technology used for business purposes in the company. Operational knowledge signifies the types of standard operating procedures defined by the organization and skill knowledge basically covers the different skill sets to ensure that the employee is able to perform the duties required.

B. LMS Key Features

The following key features has been identified as the Corporate LMS key features

- Knowledge is accessible on demand.
- Continuous knowledge update.
- Knowledge can be revised.
- Clear knowledge structured.
- Assessment module with certification.
- Dynamic session and enrolment.

C. LMS Data Structures

The analysis effort to come out with corporate LMS for the company has been finalized to the following data structure. Table 1 below describes the main entities of LMS and their applicability in the corporate model. The corporate model of the LMS has the option of implementing the session base program or simply eliminates the session to make the program to be continuous learning model. The enrolment into the program should be made automated in the corporate model. In order to adopt The LMS to the corporate model, we map the applicable academic LMS into the corporate model.

Table 1
Main Entities for Corporate LMS

Entities	Description of Entities in Corporate LMS
Courses	Intended certification program such Network Certification for work competency can be the program in the corporate.
Program	Certification for work competency can be the program in the corporate.
Assessment	Assessment should be made available for all the courses
Certification	Training and certification records
Organization Structure	Company and department structure for corporate
Session	Can be optional for corporate model
Student	Staff data for corporate
Lecturers	Course trainer info
Enrolment	Can be optional for corporate model

The Figure 6 below illustrates the mapping of traditional education-based LMS to a more suited for corporate use. It is evident from the mapping; several components are not required in the corporate model due to the difference of approach in utilizing the LMS. Corporate LMS model does not require enrolment and session model as the period of knowledge accumulation for an employee is not limited to a certain amount of time.
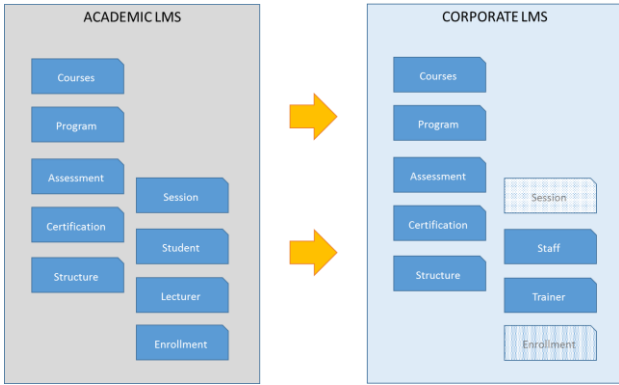
Figure 6: Mapping LMS from academic to corporate model

The Figure 7 below then identifies further the type business activities carried out in a business organization which then can be mapped to the knowledge management in the company.
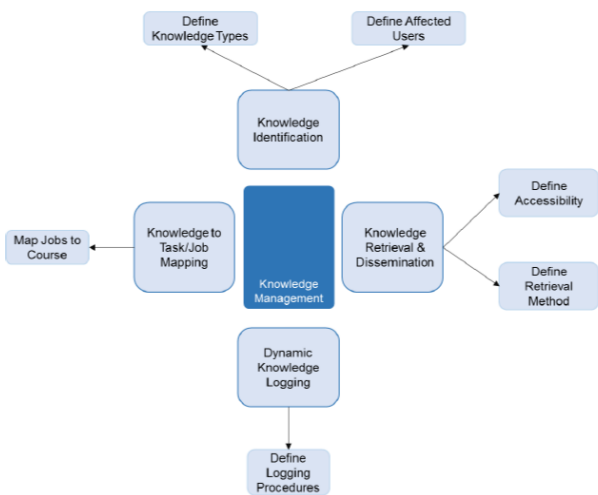

Figure 7: Corporate activities to course mapping diagram

D. LMS Workflow Model

Once the mapping is correctly done, then the proposed LMS On-Demand Learning Concept can be visualized as below.
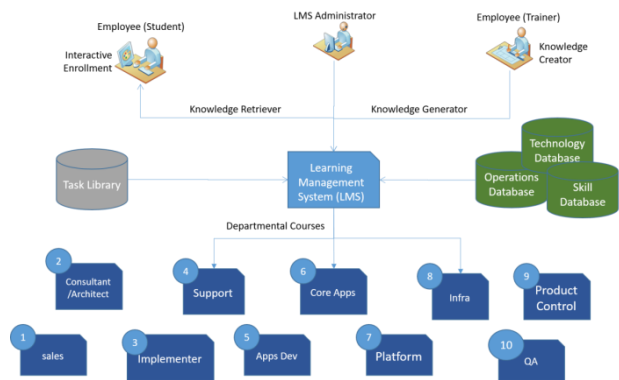

Figure 8: LMS on-demand learning workflow concept for cloud ERP production environment

As the Figure 8 shows, the On-Demand Learning Concept is greatly dependent on the ability of the system to

pool the necessary resources and matches it with the needs of the department within the organization. Each department will require different sets of courses to be imparted to their respective staff. With the On-Demand concept, staff/employee will be given the ability to choose and undergo the training when it is required.

E. The LMS Software Development

The LMS software has finally been developed with the guide from the requirement mentioned above. The system is made with personalization access for all staff of the company and students' data is map directly from company human resource database. Figures 9 – 12 shows the progress of the system development for the Corporate LMS System.
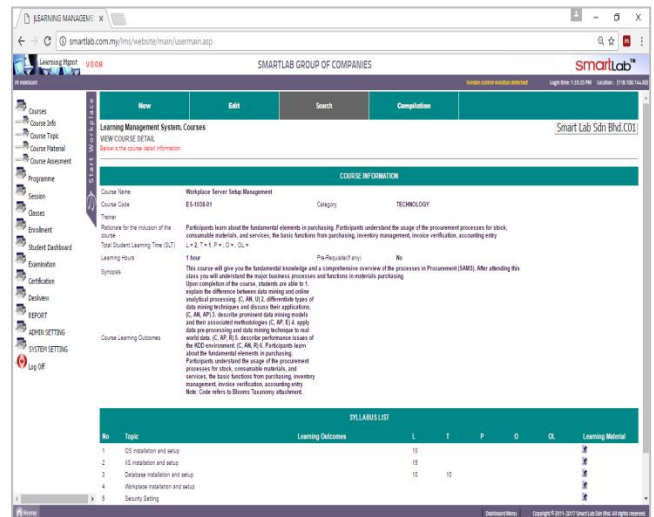

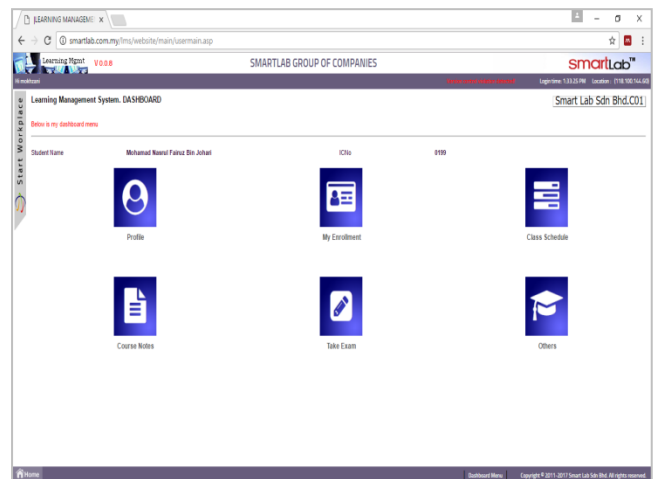Figure 9: Corporate LMS system course set up

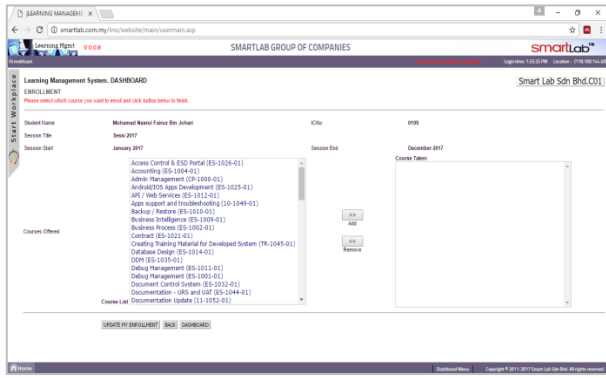Figure 10: Employee dashboard in corporate LMS system

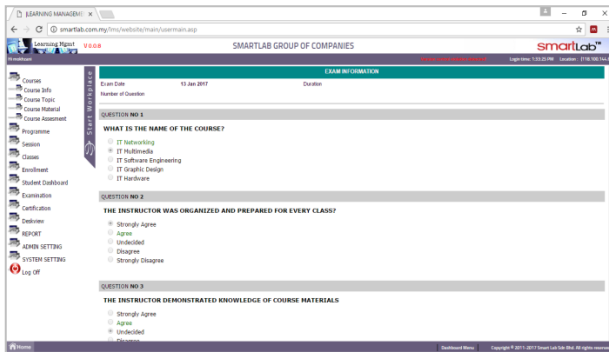Figure 11: Course registration through employee dashboard

Figure 12: Course assessment module in corporate LMS system

V. CONCLUSION

This paper discussed the use of academic LMS to develop corporate LMS as the company's knowledge repository in the Cloud ERP domain. The LMS system also serves as the on-demand knowledge retrievals and updates of the company knowledge database. The LMS adaptation as the company knowledge retention tool should be continued with the update of the knowledge into the system. The process of knowledge update will be done as work activities and incrementally. The assessment data for all the courses should be made available for LMS to be effective tool. Future integration with work order or task management can also be incorporated to enhance the LMS on-demand effect. Finally, knowledge transferred model from academic LMS to corporate LMS has been successfully carried-out as planned and will be further improved in order to maximize its capability of knowledge retention in the knowledge-based organization.

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