Journal of Theoretical and Applied Information Technology
31st August 2014. Vol. 66 No.3

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

DEVELOPMENT OF KNOWLEDGE REPOSITORY SYSTEM AT DIVISION OF INFORMATION TECHNOLOGY IN PT XYZ (A CASE STUDY APPROACH)

YOHANNES KURNIAWAN, FLORENCIA IRENA, FELICIA RATNA CHANDRA DEWI, IRENE STEPHANI

Bina Nusantara University, Department of Information Systems, Jakarta – 11480, Indonesia

E-mail: kurniawan_yohannes@yahoo.com, floren_irena29@yahoo.com, feliiciarcd@yahoo.com, renetchi@gmail.com

ABSTRACT

PT. XYZ realizes that knowledge is one of the truly valuable asset for the company. Therefore, PT. XYZ wants to build knowledge repository system as a tool to support the knowledge capture process and management, also the knowledge sharing between employees. The purpose of this writing is to design a knowledge repository system at PT. XYZ so we can recommend the concept and design of knowledge repository system that will be developed in the future. Design methods used here are data collection method from interview, literature study, and also system analysis and design method based on object according to Bennett. Results to be achieved are the concept and design, also the prototype of knowledge repository system. From this writing we can summarize that with the automated storage and search structure, it is expected to bring ease for the employees in searching the required knowledge. This recommendation of storage system is useful to keep all knowledge from every PT. XYZ employee. Nevertheless, the content management is required to ensure the accuracy of the stored knowledge.

Keywords: *Knowledge Management, Application, Information Technology*

1. INTRODUCTION

Knowledge Management is an important field for an organizational learning process. The existence of knowledge repositories within an organization becomes an important element of knowledge management activities that must be managed within the organization to support the ongoing process of learning itself. PT. XYZ is the IT solution provider company which has handled many clients. One IT Solution offered by this company is the implementation of an ERP system based on SAP Business One. The major problem of SAP Operations Division at PT. XYZ is the difficulty in doing the tracking problem, because they don't have a specific standard, so the storage of existing documents are not structured and stored properly. In providing its services, XYZ requires a knowledge repository that helps in the management of information and knowledge documentation. The development of knowledge repository can be used by organizations as a solution to capture and empower the knowledge of its members (knowledge workers). Knowledge workers can also improve their knowledge by exploring the knowledge that is stored in the knowledge repository.

2. LITERATURE REVIEW

Wiig [1] emphasize that, given the importance of knowledge in virtually all areas of daily and commercial life, two knowledge related aspects are vital for viability and success at any level. Knowledge management make use of a mixture of techniques from knowledge based system design, such as structured knowledge acquisition strategies from subject matter expert [2]. Knowledge management consist of "Leveraging intellectual assets to enhace the organizational performance" [3].

Knowledge management develops system and processes to acquire and share knowledge assets. Knowledge management is narrowly defined as an information technology system that dispenses organizational know-how [4]. Basically knowledge management provides benefits not only for individual employees, but to community of practice, and to the organization itself. This is 3 tiered view of KM helps emphasize why KM is important today (See Table 1)

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Table 1. KM for Individuals, Communities, and Organizations [4]

Stakeholders	Benefits
Individual	• Helps people do their jobs and save time through better decision making and problem solving. • Builds a sense of community bonds within the organization • Helps people to keep up to date • Provide challenges and opportunities to contribute
Community of Practice	• Develops professional skills • Promotes peer to peer mentoring • Facilitates more effective networking and collaboration • Develops a professional code of ethics that member can adhere to • Develops a common language
Organization	• Helps drive strategy • Solves problems quickly • Diffuses best practices • Improves knowledge embedded in products and services • Cross fertilizes ideas and increases opportunities for innovation • Enables organizations to better stay ahead of the competition • Builds organizational memory

KM is essentially a process for optimizing the effective application of intellectual capital to achieve objective [5]. In other words, KM concentrates on the processes and people involved in any area and aims to distil the most relevant information necessary to solve a problem or integrate processes [6].

Kuo [7] further emphasized the trend and necessity of using information technology to conduct knowledge management in schools and believed that school members should gain a deeper understanding of knowledge management. Therefore, schools should continue to improve their existing operating models and should understand the appropriate procedures of searching, storage, duplication, and application in order to gather necessary knowledge [8].

4. RESEARCH METHOD

The writing method for this paper is qualitative. The method used in data collection was reviews from the literature and direct observation at PT XYZ. Reference sources used are a variety of books and journals. Another source of internet is includes supporting sites. The form of paper will be presented in descriptive format. The method of analysis will be used for the construction of a knowledge repository system is using the activity diagram of Unified Modeling Language [9] to describe the business processes that are running in the PT. XYZ. The limitation of this study is to discuss only the aspects of the analysis and design of KM systems.

5. RESULTS AND DISCUSSION

From the research, the findings obtained by the existing problem in the IT division of PT. XYZ, that employees have difficulties to tracking the problems. For example, employees need information whether the problem had happened before this is an issue or problem that is appearing for the first time. The reason is the existing documents are not currently structured or stored properly (does not have specific standards in the conduct of storage). Additionally, all documentation activities is complete and always documented, but the PT. XYZ uses only simple file server for storage. Error in determining the storage location is also very large because the lack of standardization of document storage. So it's make difficulty for disseminating information and knowledge sharing among fellow employees. So the company needs to develop knowledge repository system. We analysis and design Knowledge Repository Development based on seven core knowledge management step by Shelda Debowski [10]:

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

1. ***Identify Core Business and Its Knowledge Requirements***

SAP division business focus as a service provider of IT Solutions and as a support to a variety of client problems.

The finding that there is a problem in the SAP division of PT. XYZ, namely:

- In analyzing the problem, employees have difficulty in tracking problems. For example, employees need information whether the problem had happened before this is an issue or problem that is appearing for the first time. The reason is that existing documents are not currently structured or stored properly (does not have specific standards in the conduct of storage).
- All documentation of activities is complete and always has been documented, but PT. XYX just used a simple file server for storage. Error in determining the storage location is also very large because the lack of standardization of document storage. So it's difficult for disseminating information and knowledge sharing among fellow employees.

2. ***Define Knowledge Domain***

Based on the core processes of knowledge identification and knowledge requirements, knowledge domain owned by SAP division currently includes :

- Operational Knowledge, that all knowledge is related to the need for incident, change, and release management , which will facilitate the process of extracting information and problem tracking problems that occur in the SAP system in the client companies.
- Technical Knowledge, which is useful knowledge to guide the employee , such as:
  - Standard Operation Procedure, all forms of SAP division (such as: New Change Request Procedure, Procedure Change Management, Release Management Policy). Knowledge of SOP (Standard Operating Procedure) is necessary so that the employee is able to perform the work in accordance with predetermined rules.
  - User Guide, a guide for users of the system / application easyCMDB. Knowledge of the use of the system to be controlled easyCMDB, employee requests for all incidents are reported and resolved through the system.
  - Training Materials, a training material for trainers and trainees. Training materials can be a basic knowledge of SAP and basic knowledge about the client's SAP division. It is very important for the employee to be master in the existing business area on each client.

3. ***Review Knowledge Capabilities***

SAP division employees have a good understanding of the focus of activity and division of their obligations in carrying out business activities. As described in the first phase, the search problems have important knowledge and data storage. Each employee has a definitely different knowledge based on their work experience. The work experience must be distributed to other employees so that they can broaden their knowledge. Constraints that current processes are the data storage does not have a specific standard, so that only the files stored in the server manually. The impacted for employees are difficulties to search the knowledge of employees needed.

4. ***Define Core Knowledge***

As the division that is responsible for handling client requests, a division of SAP has a core of knowledge that can be categorized as follows:

a) Knowledge of the basic core for the employee

- The process of handling requests that have been documented. All requests are ongoing or have been completed documented both physical (paper) as well as the file server. The purpose of this document is for reference and learning for the future requests.
- Training Materials, a training material for trainers and trainees. Training materials can be a basic knowledge of SAP and basic knowledge about the client's SAP division. It is very important for the employee to be as master for the existing business area on each client.

b) Core knowledge developed

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

- Improvement Proposal, a proposal that contains a company's business process improvement proposal or proposed systems to be developed.
- To Be Design, a document to describe the system design view, process flow, and the functional specification of the proposed system.

5. *Develop Core Knowledge Policy*

After learning the core knowledge possessed today, we need a policy that the core knowledge can be shared by all employees of SAP division. The Inukshuk KM model used to develop policy guidelines in the core knowledge.

a) *Inukshuk Knowledge Management Model*

- *Culture*

Creating a work culture for the consultant, who have handled a client request to always make a summary of documentation request handling. All documentation is placed on the file server for the sharing of information among consultants. The contents of the file server is not limited to operational documentation, but it can contain other documents that support the company's activities, such as training documents SAP Development Program. In addition, sharing culture is also carried out with various activities such as meetings and training on a regular basis by the company, so much new knowledge that can be acquired by the employees.

- *Technology*

The technology used in the SAP division currently includes:

a. The use of the file server with the limited access.
b. Email, Miscrosoft Outlook to assist the dissemination of information or important agenda.
c. Application easyCMDB in handling client requests.

- *Leadership*

Leadership style of the director of the company is a hierarchy. All ideas, opinions, minutes of meetings of each employee must be discussed and approved in advance by the supervisor. Documentation handling client requests, as well as other standard documents stored in the file server with limited access. The access right to the file server is according to the employee's role. Only managers can add and modify folders on the file server. Another employee can insert the document in the file server, but the manager still monitoring the contents of the document.

- *Socialization (Tacit – Tacit)*

Frequently the employee and the employer conduct meetings, either meetings scheduled and impromptu meetings. Based on the discussion during the meeting, a lot of knowledge that can be obtained. In addition, the employees are also given training on a regular basis by the company. But not all employees can attend training. So the knowledge during training or meeting can be an asset for other employees, especially if there is a new employee.

- *Externalization (Tacit – Explicit)*

When the employees are finished handling requests or problems, then they will make a conclusion or summary to be documented to enable the sharing of information that will assist other employees in dealing with similar client request. Results documentation will be accommodated on a file server, but the obstacles faced is the lack of content management on the file server so that complicate the process of knowledge sharing as many files or documentation that is not grouped according to certain criteria. Another constraint is the storage file server that is still manual, so it is likely to save the file in a location that is not exactly.

- *Combination (Explicit – Explicit)*

Combination process is done when employees make changes to the client's request. In making changes / service / client request, the employee must have a basic knowledge and experience to support the changes made. They will combine knowledge from books or other written documentation or documentation and make conclusions in a summary or article. The process also occurs when there is a combination of the impact of changes in development or service that is done, then the employee will analyze the problem solving alternatives, and documenting changes again. The results of such documentation kept on file in the file server. So it will form a new knowledge becomes more corporate assets.

- *Internalization (Explicit – Tacit)*

The process of internalization occurs when the result of the documentation on changes made in handling client requests used to be learned by other internal employees in dealing with a similar request. But in terms of access, learn, and explore a report or documentation handling a client request, the employee must seek one by one without any grouping changes ever made to an object clearly. It became less effective and

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

efficient because they have to do the search manually.

- *Tacit Knowledge*
  Each employee has different abilities and experience in handling reports / client request. Knowledge every employee can continue to grow, PT. XYZ hold meetings and training. Knowledge that comes with every employee can be given to other employees by sharing. However, it is hampered by the absence of workload, time owned by each employee, as well as a means of sharing the existing knowledge so that knowledge can not be optimized. Tacit Knowledge on the SAP division included:
  - Training of company.
  - Seminar.
  - Meetings.
  - Handling client requests by phone.
  - The result of the discussion / briefing.
  - Experience (assignments) for employees working in the company.
- *Explicit Knowledge*
  Every job that has been completed will be documented by recording the results of a conclusion or summary handling client requests. In addition, PT. XYZ also have materials SAP Training Development Program as initial training for new employees. The obstacles, these documents are stored manually in file server, so it is likely to save the file in a location that is not exactly. In addition, the unstructured storage make a difficulty for employees for the reference search. the explicit knowledge of the company are:

Operational Knowledge:

- Request For Change Form, is to make the change request form.
- Improvement Proposal, a proposal that contains a company's business process improvement proposal or proposals that the system will be developed.
- To Be Design, a document to describe the system design view, process flow, and the functional specification of the proposed system.
- Functional Specification, a specification or a logical solution for the incident or change request. Functional Specification contains logic made by the employee, will then be passed on to ABAPER codified.
- The process of handling requests that have been documented.
- Business Scenario, scenario is a collection of events that are used to test and verify that the system can work properly for a variety of business conditions.

Technical Knowledge:

- The basic material to support operations, can be the basis of SAP materials, basic materials about the client's business area, as well as the basic material of the project.
- Procedure for guidance in conducting operations.
- All documentation templates used in operating activities.
- All kinds of reports are generated to measure and evaluate the operations that have been carried out.

- *Measurement*
  The process of knowledge management activities in PT. XYZ does not have specific measurements to generate knowledge that can be used as learning for employees.

6. *Map Core Knowledge*

After learning division of SAP knowledge possessed today, the knowledge to perform the categorization. Results categorization knowledge will then be referred to as the Knowledge Taxonomy.

Designing Knowledge Taxonomy divided by two types of knowledge that are owned division of SAP, namely Operational Knowledge and Technical Knowledge. Operational Knowledge is all knowledge relating to the operations of the company, for example, documentation handling client requests. While Technical Knowledge related to the knowledge that support operations, such as SOP, form templates, and basic material SAP.

Operational activities closely linked to the client companies held by the SAP division of PT. XYZ. Each company has their respective business areas. Each business area also has different modules. To Technically, only divided by type only.

- Form, containing all the basic template or framework document, among other things: Change Request Form, To Be Design Document, and Improvement Proposal.
- Project Initialization, base material outlining the initial steps in starting a project.

Journal of Theoretical and Applied Information Technology
31st August 2014. Vol. 66 No.3

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

- Report, is any form of a report produced by the division of SAP, such as incident reports and change.
- Procedure, any procedure (SOP) or the regulations set by PT. XYZ.
- SAP Training, all training materials on the basis of SAP.

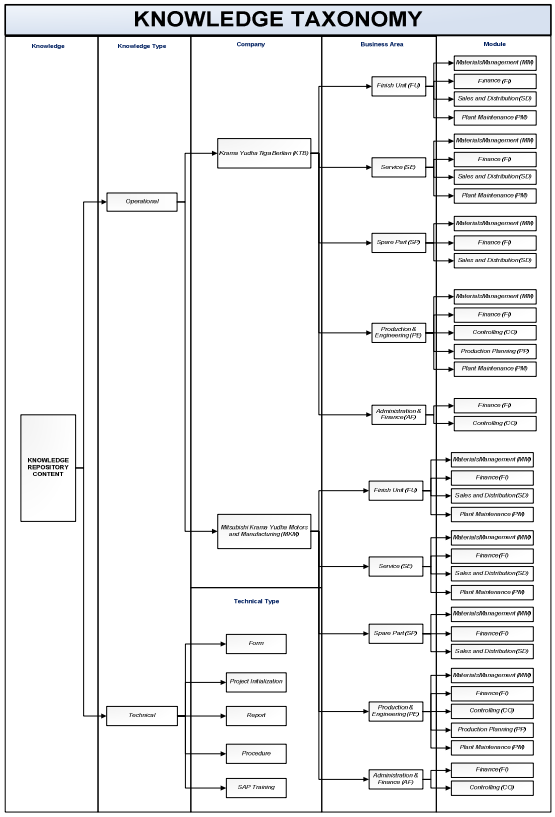

Figure 1 Proposed Knowledge Taxonomy at SAP Division, PT. XYZ

7. *Build Knowledge Repository*

Based on the analysis above, we can make a knowledge repository to solve the problems. Knowledge Repository Systems are designed to provide solutions to solve the problems. The design was created with UML diagrams, namely:

A. Use Case Diagram

According to Bennett, McRobb, and Farmer (2006: 145) use case is a diagram that describes a set of related transactions from the perspective of the user, which is usually done on an ongoing basis so as to produce a useful value of early users. Use case diagrams are used to demonstrate the functionality provided by the system and show several ways to communicate with the users who will be using the system for these functions. Figure 2 show the design Use Case Diagram for Knowledge Repository system.

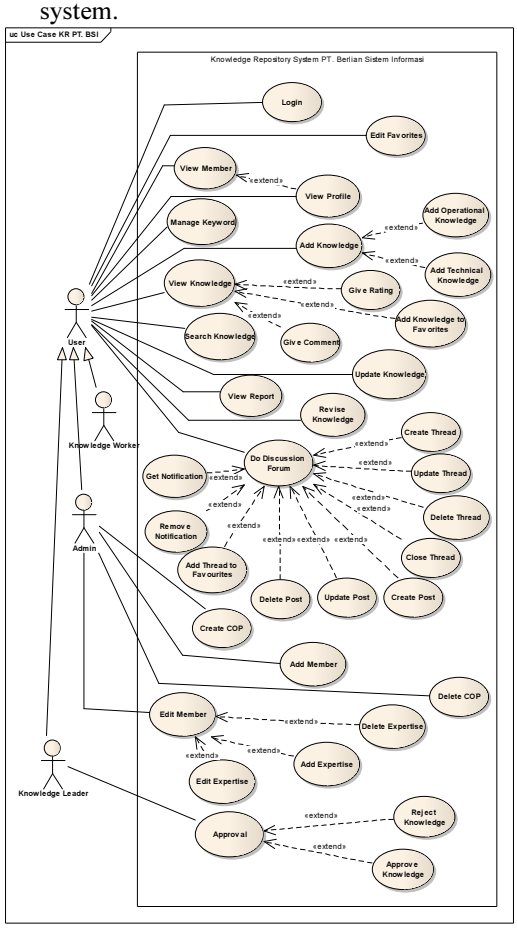

Figure 2 Use Case Diagram Knowledge Repository System

B. Class Diagram

Class diagram is a UML diagram that describes the structure of classes with attributes and operations, along with the relationship or association between the classes. The definition of a class in a class diagram is a description for a collection of similar objects logically in terms of behavior and structure of the data [9]. Below is a Class Diagram Knowledge Repository system.

Journal of Theoretical and Applied Information Technology
31st August 2014. Vol. 66 No.3

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

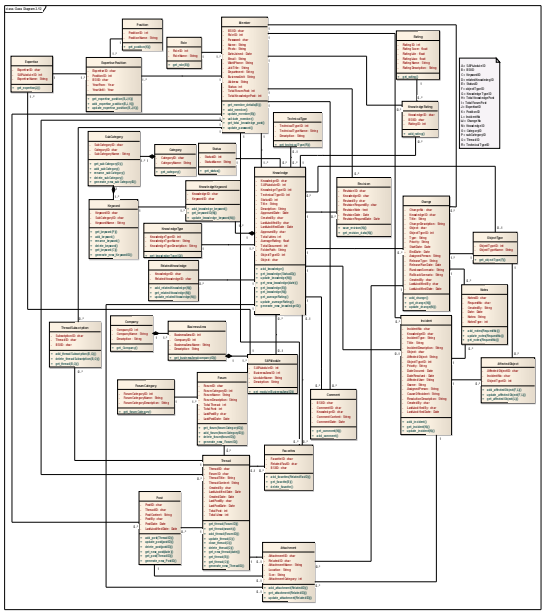

Figure 3 Class Diagram for Knowledge Repository System

From the results of the design above, the following is an example of the user interface (Figure 4 and 5):

Figure 4 Add New Knowledge – Operational

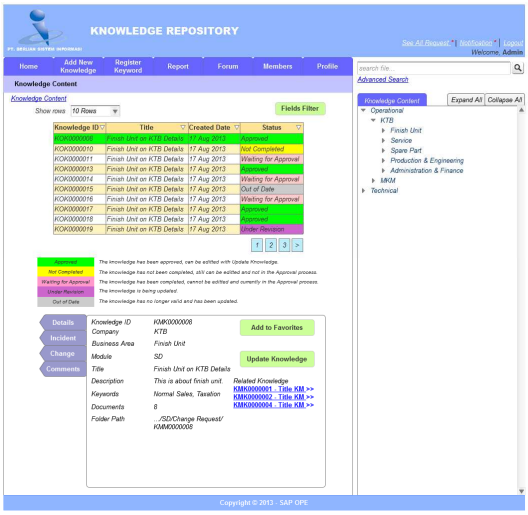

Figure 5 Knowledge Content – Operational (Tab Details)

6. CONCLUSIONS

From the analysis activities, the major problem of SAP Operations Division at PT. XYZ is the difficulty in doing the tracking problem, because they don't have a specific standards, so the storage of existing documents are not structured and stored properly. Storage and retrieval structure that has automated expected to provide facilities for employees to seek knowledge required. Proposed design of the storage system is also expected to be useful for storing knowledge of any employee of PT. XYZ. However, content management is also needed to ensure the accuracy of the knowledge that has been stored, for which we propose the existence of knowledge approval.

In the implementation Knowledge Repository System, the support of top management is very important. Without a strong commitment and support, then this system becomes worthless. Formation of a knowledge sharing culture is very difficult to do, but through continuous communication, it becomes very likely. Moreover the process of sharing knowledge that we have proposed has been designed to become part of the company's operations. And for further maximize the use of the knowledge stored in the Knowledge Repository System and reduce the workload of employees, will be created a special portal page to the client, which will display the knowledge that are open and accessible to the client, so as to common problems that occur will be resolved solely by the client. This study is expected to be used as a reference for the development of

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

knowledge management system in the other organizations.

REFERENCES:

[1] K. Wiig, "Knowledge Management Foundations". Arlington, TX: Schema Press, 1993.
[2] K. McGraw, and K. Harrison-Briggs," Knowledge Acquisition: Principle and Guideline". Englewood Cliffs, NJ: Prentice Hall, 1989.
[3] M. Stankosky, Keynote address to ICICKM (International Conference on Intellectual Capital, Knowledge Management and Organisational Learning), 2008, pp. 9-10.
[4] K. Dalkir, "Knowledge Management in Theory and Practice". Cambridge, MA: Massachusetts Institute of Technology, 2011.
[5] A. Bennet and D. Bennet, "Organizational survival in the new world: the intelligent complex adaptive system". Boston: Elsevier, 2004.
[6] Learning for Sustainability, 2010, "Knowledge management and information". Available from http://learningforsustainability.net/social_learning/knowledgemanagement.php, 2014.
[7] Y. F. Kuo, A study on service quality of virtual community. Total QualityManagement & Business Excellence, Vol. 14, No. 4, 2003, pp. 461-473.
[8] D.R. Richard, Technology: Where students learn. American School & University, Vol. 47, No. 3, 2001, pp. 360-363.
[9] S. Bennett, S. McRobb, & R. Farmer, "Object-Oriented Systems Analysis And Design Using UML". New York: McGraw-Hill, 2006.
[10] S. Debowski, "*Knowledge Management"*. John Wiley & Sons Australia, Ltd, 2006.