International Journal of Multimedia and Ubiquitous Engineering
Vol. 9, No. 12 (2014), pp. 229-240
http://dx.doi.org/10.14257/ijmue.2014.9.12.21

Analysis and Design of Knowledge Management Systems for School of Information System at XYZ University (A Case Study Approach)

Yohannes Kurniawan and Siti Elda Hierera

Bina Nusantara University, Jakarta, 11480, Indonesia
Kurniawan_yohannes@yahoo.com, elda.siti@gmail.com

Abstract

The purpose of this paper is to analyze and to design knowledge management systems in the School of Information Systems at XYZ University, which will improve organization's performance and deliver innovation to organization as well as provide solutions when it's needed. Analytical method that used in this study consist of two methods namely data & information collection method and analysis & design information systems method. Data & information collection method was obtained based on literature review study, while analysis & design information systems method was obtained by using object based information systems with the unified processes. The conclusion from this research is knowledge management systems provide solutions to address the problem of managing knowledge in academic and operation area in the School of Information Systems, by designing web based information systems which can make the process of production and distribution knowledge more effective and more efficient.

Keywords: *knowledge management, analysis, design*

1. Introduction

In the competition era among educational institutions, especially in a higher education or university level, the management inside organizations are required to face new challenges especially in nature of competition changes and also in dynamic environment or constantly changing and evolving (See Figure 1). So as universities should increase good quality services that will lead to student satisfaction. The universities not only will compete in national level but also compete in global level. One of the strategies that will help the organization to provide good quality services and also able to compete globally is by applying knowledge management (KM) to enhance knowledge sharing process.

And Boisot [1] proposed two key points about knowledge sharing: (1) The more easily data can be structured and converted into information; (2) The less data that has been so structured requires a shared context for its diffusion.

ISSN: 1975-0080 IJMUE

Indonesia

ranking	World Rank	University	Det.	Presence Rank*	Impact Rank*	Openness Rank*	Excellence Rank*
1	600	Institute of Technology Bandung		416	195	557	1952
2	640	Universitas Gadjah Mada		216	238	701	1952
3	653	University of Indonesia		114	357	113	1782
4	1084	Universitas Padjadjaran		1292	408	618	3103
5	1165	Gunadarma University		365	212	15	4440
6	1254	Brawijaya University		810	647	203	3103
7	1290	Bogor Agricultural University		494	1040	174	2507
8	1360	Petra Christian University		536	442	103	4086
9	1404	(3) Airlangga University		284	1101	106	2810
10	1455	Diponegoro University		704	981	430	3037
11	1557	Universitas Katolik Indonesia Atma Jaya		687	549	11264	3863
12	1584	Universitas Pendidkan Indonesia / Indonesia University of Education		385	538	285	4440
13	1620	Institut Teknologi Sepuluh Nopember		544	1207	126	3186
14	1647	Universitas Muhammadiyah Yogyakarta		1568	365	646	5080
15	1701	Universitas Sumatera Utara		798	665	319	4440
16	1719	STISI Telkom		1691	443	381	5080
17	1819	Universitas Esa Unggul (Universitas Indonusa)		4036	430	4176	5080
18	1828	Universitas Sriwijaya		660	606	78	5080
19	1850	Universitas Sebelas Maret		855	752	1570	4440
20	1858	Universitas Islam Indonesia		732	609	231	5080
21	1866	Universitas Mercu Buana		1548	554	729	5080
22	2172	Universitas Nusa Cendana		4245	650	16039	5080
23	2384	Universitas Negeri Malang		647	1616	70	4440
24	2480	Universitas Muhammadiyah Surakarta		615	1226	652	5080
25	2524	Universitas Hang Tuah		4566	1013	12276	5080

Figure Error! No text of specified style in document.**. Ranking of Web Universities [2]**

"Knowledge Management (KM) is a discipline which enable people as an individual, a team and the entire of organization to create, share and apply knowledge either collectively or systematically, in order to achieve their organizations goals better" [3]. The basic goal of knowledge management is to leverage knowledge to the organizational advantage [4]. Knowledge Management is a collaborative and integrated approach to creation, capture, organization, access and use of companies intellectual assets [5]. Knowledge Management consists of leveraging intellectual assets to enhance organizational performance [6].

Today, the problems which exist in the School of Information Systems at XYZ University is a slow transferring knowledge process between employees when there are any organization structure changes. The other problem is due to the unavailability of documentation for any knowledge that employees have and "The most knowledgeable employees often leave first" [7].

Based on those problems, it is necessary to build Knowledge Management application in order to assist the transferring knowledge process between employees in the School of Information Systems at XYZ University. Consequently, Knowledge Management System is a

way to document all forms of knowledge which exist in the School of Information Systems. The creation and management of an environment that encourages knowledge to be created, shared, enhanced, organized, and utilized for the organization benefits [8].

Therefore, alongwith the effectiveness of knowledge management, it will be a key driver of new knowledge and new ideas into the innovation processes. Knowledge Management Systems also can be a solution for the existing problems. So that, the use of knowledge management systems are become a critical part in terms of improving the work performance and source of competitive advantage for some universities.

Thus, the authors are interested in writing about the proposed implementation of Knowledge Management Systems in the School of Information Systems at XYZ University. Knowledge Management which implemented in the School of Information Systems at XYZ University, is expected to be effective in order to improve the performance of the organization, both in creating a network that facilitates knowledge for the organization as well as in generating innovative ideas or solutions for problems that arise.

2. Method

Writing method for this paper is qualitative. The method used in data collection was reviewed from the literature and direct observation in the School of Information System at XYZ University. Reference sources used are consist of variety of books and international journals. Retrieving information or data by quoting the contents of the books or from the internet and using the available data as supporting evidence the authors put forward of a statement, while for analysis & design information systems method was obtained using object based information systems with the unified process. The nature and form of paper to be presented in descriptive format.

3. Results and Discussion

The main reasons for KM implementation as a solution in Management Education are [9]: (1) All Management institutes possess a state of the modern information infrastructure; (2) Sharing knowledge among teaching staff, students, and administration staff in all management institutes; (3) The academic environment in generally is considered trustful in the sense that no one is hesitating nor being afraid of publishing knowledge; (4) Each institute wants its internal documentation management and the level of information and knowledge sharing to improve; (5) There is an increased demand for new strategies that help management institutions meet external and internal demands.

KM technology (tools) is used to facilitate communication, collaboration, and content management for the better knowledge capture, sharing, and application. Ruggles [10] proposes a classification of KM technology as a tool that intervene in knowledge processing (See Table 1).

Table 1. KM Technology Benefits

KM technology benefits	To enhance and enable knowledge generation, codification, and transfer
	Generate knowledge based on the current data or information analysis
	Code knowledge to make knowledge available for others
	Transfer knowledge to decrease problems

After we know about technology that can support knowledge management in organizations, the next step is to create an event Table (Table 2), which presents the event which related with the system which being developed.

Table 2. Event Table for Knowledge Management

Event	Trigger	Source	Use case	Response	Destination
Admin / staff login	Open KM inquiry	Admin / staff	Login	Redirect into homepage	Admin / staff
Admin addknowledge	New knowledge	Admin	Add knowledge	Message: Add knowledge success	-
Staff requesting knowledge	New knowledge Request	Staff	Request knowledge	Message: request knowledge success	Admin
Admin approve request knowledge	Knowledge request	Admin	Approve request knowledge	Knowledge approval / rejection	-
Admin search request knowledge history	Knowledge request history inquiry	Admin	Search request knowledge history	List request knowledge history	Admin / staff
Admin edit knowledge	Knowledge	Admin	Edit knowledge	Message: change knowledge success	-
Admin check validation	Knowledge	Admin	Check validation	Validation Knowledge changed	-
Admin add knowledge into favorites	Knowledge	Admin	Manage favorites	Updated favorites	-
Admin / staff view, review, search, and find knowledge	Knowledge inquiry	Admin / staff	Search knowledge	List of knowledge which searched	Admin / staff
Admin see, review, search and find user	User inquiry	Admin	Search user	List of users which searched	Admin
Admin changes user position	User position change inquiry	Admin	Update user position	Message: user position changes success	-
Admin / staff edit	User profile	Admin /	Edit profile	Message:	-

data profile	change inquiry	staff		Edit data profile success	
Admin / staff changes password	Password change inquiry	Admin / staff	Change password	Message: changes password success	-
Admin reset password user into default	Reset password inquiry	Staff	Reset password	Message: Reset password success	Staff
Admin add new user	New user	Admin	Add new user	Message: Add new user success	-
Admin add category	New category	Admin	Add category	Category	-
Admin add subcategory	New subcategory	Admin	Add subcategory	Subcategor y	-
Admin changes category name	Category change inquiry	Admin	Edit category	Updated category	-
Admin change subcategory	Subcategory change inquiry	Admin	Edit subcategory	Updated subcategory	-
Admin delete category exist	Category delete inquiry	Admin	Delete category	-	-
Admin delete subcategory exist	Subcategory delete inquiry	Admin	Delete subcategory	-	-

Based on the event Table above, the next step is design systems functionality by using use case diagram. The use case diagram divided into two parts, first is Administrator access and the second is Academic staff access (see Figure 2 and Figure 3), in each use case within use case diagram reflects KM systems function which is developed.

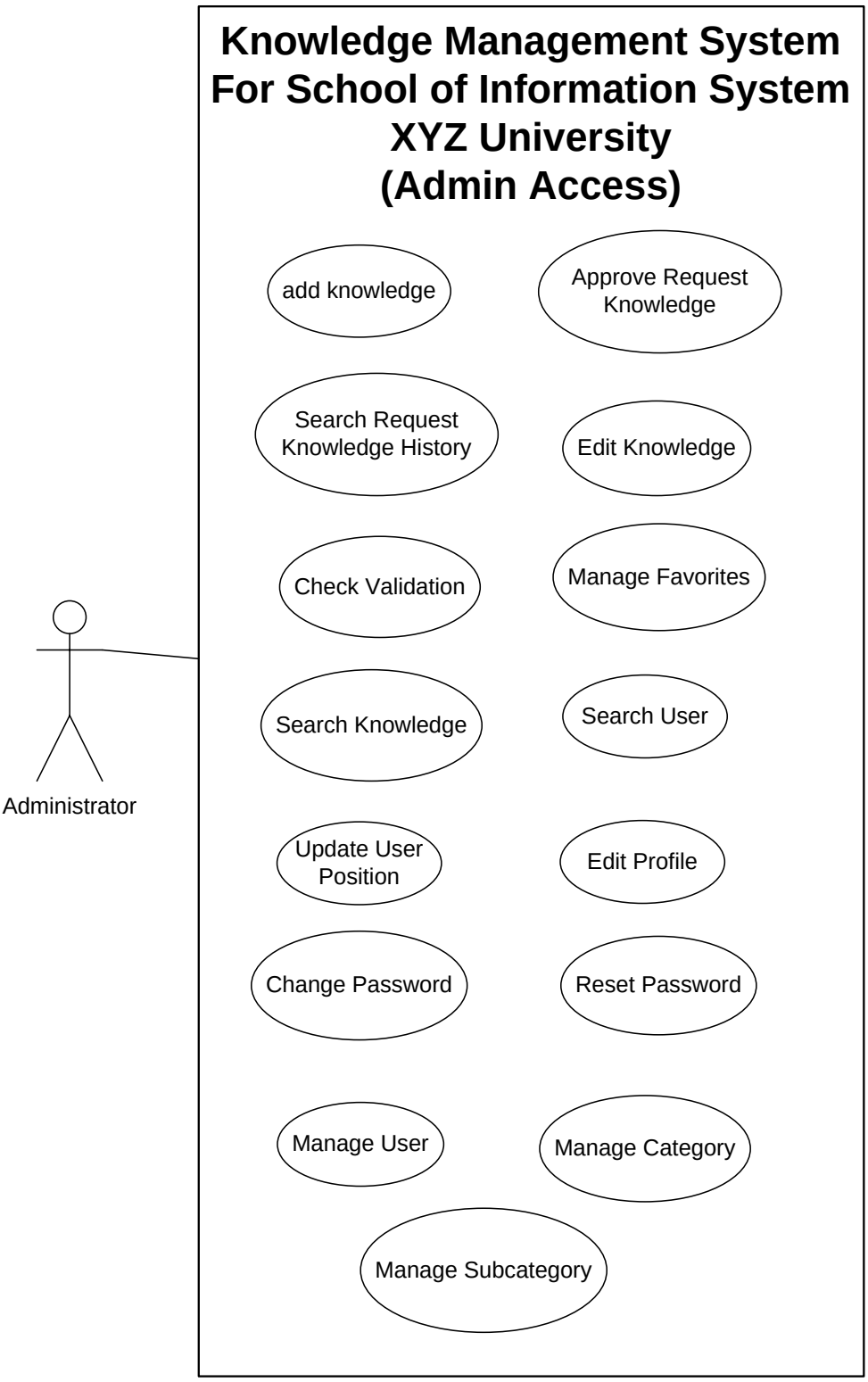

Figure 2. Use Case Diagram – Admin Access

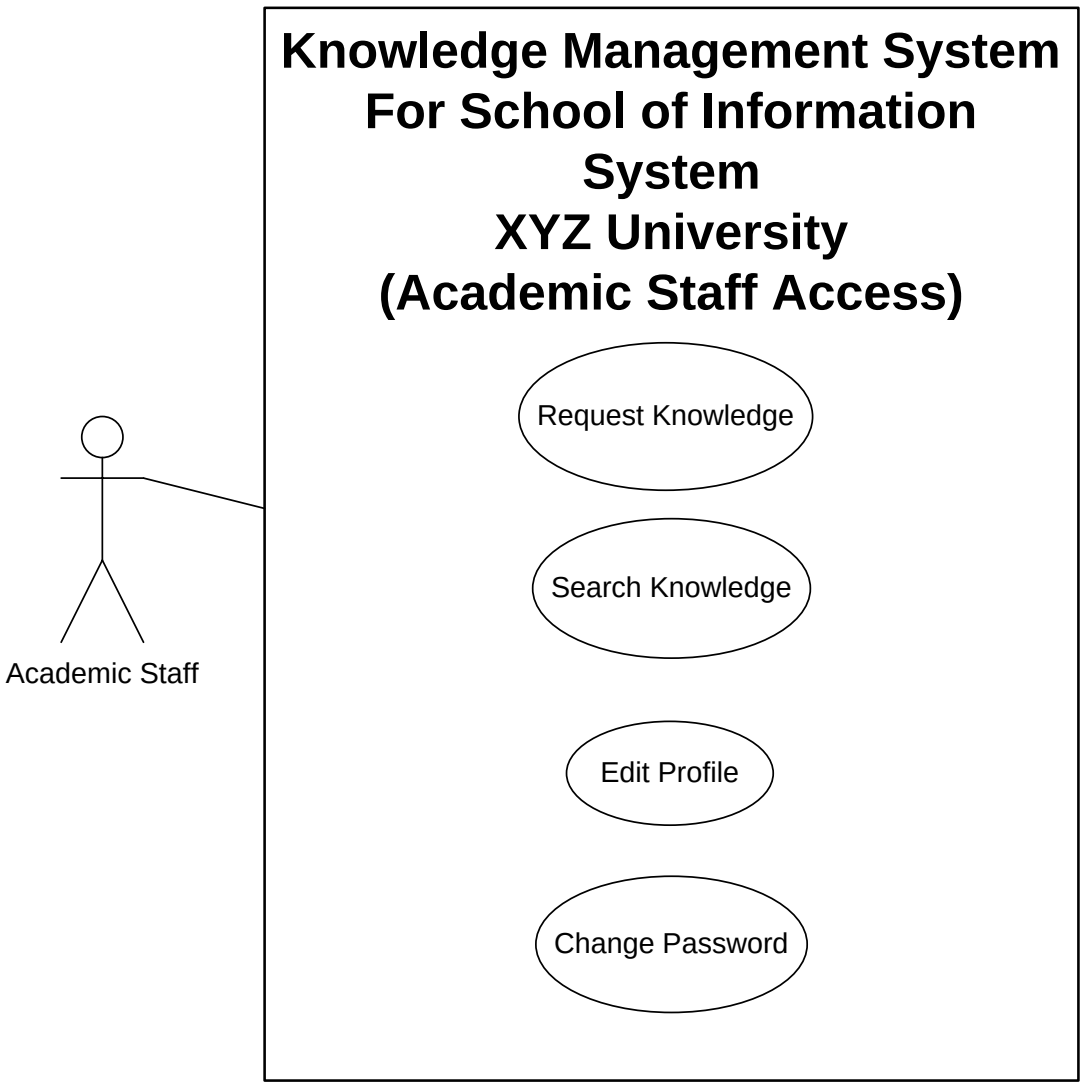

Figure 3. Use Case Diagram – Academic Staff Access

After the functionality of knowledge management systems was designed, the next step is design knowledge structure in the School of Information Systems. The concepts can be taught of as the building blocks of knowledge and expertise. Once the key concepts have been identified, we can arrange in a hierarchy as structural knowledge taxonomy.

Wiig [11] proposed a hierarchy of knowledge that consist of public, shared, and personal knowledge. Figure 4 shows Wiig hierarchy of knowledge form. Based on the hierarchy, the authors conduct designing knowledge taxonomy for School of Information Systems which consider the aspects form the basis of the Wiig KM model.

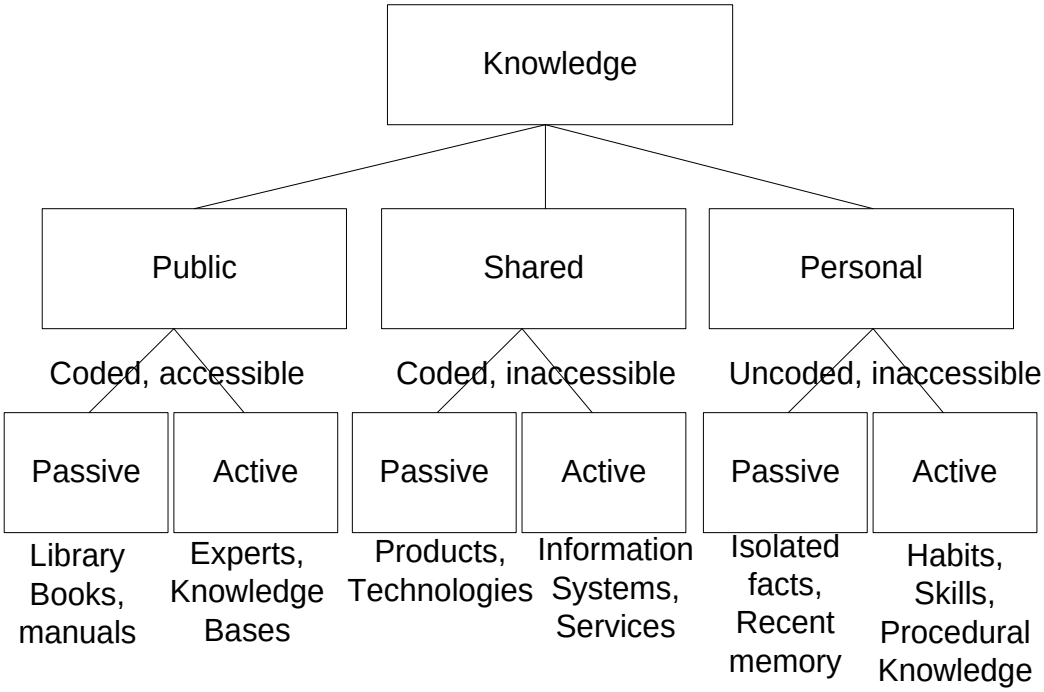

Figure 4. Form the basis of the Wiig KM Model [5]

Knowledge taxonomy allows knowledge to be graphically represented in such a way that it's reflect the logical organization concepts within a particular field of expertise [12]. Taxonomy is a classification scheme, it can be very personalized, such a name of category and sub category for the knowledge management systems. In Figure 4 below, it is shows knowledge classification for School of Information Systems in a taxonomy form.

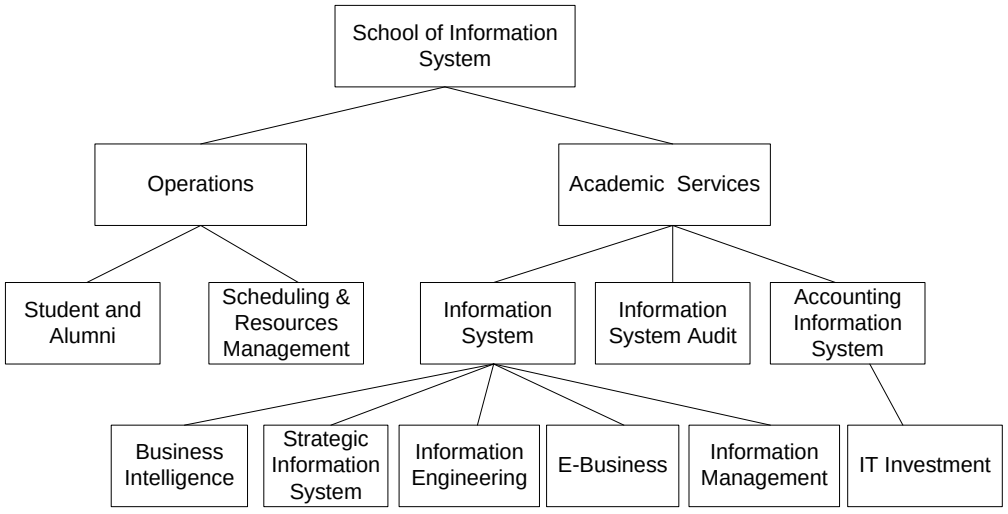

Figure 5. Knowledge Taxonomy Classification School of Information System, XYZ University

In addition to information access, the knowledge management systems must be able to quickly retrieve the most relevant data and information from the available content (See Table 3).

Table 3. Representation of Data, Information, and Knowledge in School Academic Operation

Knowledge Area	Description	Activities	Knowledge
Operations	Registration, Administration and Scheduling	Resources, Institutional plan.	Ability to deal with anomalies student information, Use current information to analyze school availability seat.
		Time table processing	Time table analysis
Academic Services	Teaching and Learning, Evaluation,	Teaching activities, consultancy assignments, course evaluation, assessment and evaluation, performance, final evaluation	Analysis of new courses, programs, inter-disciplinary subjects, communities of practice between lecturers and staff.

The design of this KM application is using centralized architecture, which means this KM application is saving the data within the database as storage. By implementing this KM systems, it is expected the documentation saving become centralized and also transferring knowledge process become easier, documented and standardized. Therefore, decision making process will be more accurate, efficient and effective (see Figure 6).

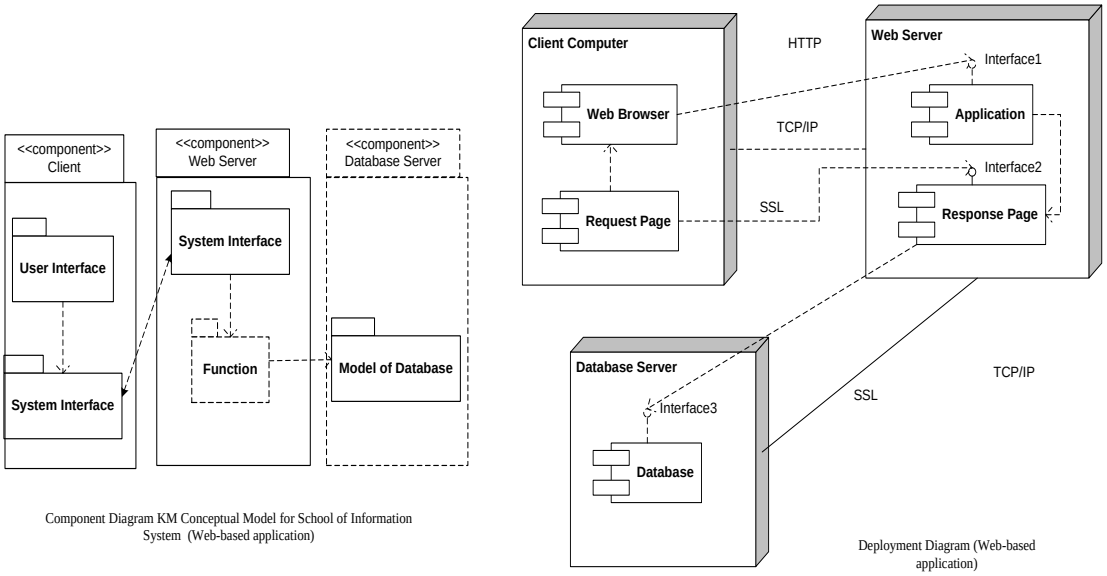

Figure 6. Component and Deployment Diagram

The KM stakeholders will accomplish this through deployment of portals (customizable web sites that provide targeted information to academic/non-academic staff and allows them to publish to specific communities), support of technologies, enhanced capture and distribution of lessons learned, support for the development of communities of practice, and creation of collaborative environments to enable sharing and managing of the knowledge developed within a community.

4. Conclusion

Based on the analysis of knowledge management processes that take place in the School of Information Systems at XYZ University nowadays, so we propose to design a web based Knowledge Management Systems which is expected to support knowledge management process, both in terms of academic and operational aspect. The Knowledge Management Systems must be able to support the existing knowledge management cycle in the organization, when the knowledge that has been captured, coded, shared, and the otherwise made available is put to actual to use. It is expected that systems design model can be implemented by other universities which want to implement Knowledge Management Systems.

References

[1]. M. Boisot, "Knowledge Assets", Oxford, Oxford University Press, UK, **(1998).**
[2]. "Webometrics", http://www.webometrics.info/en/asia/indonesia.
[3]. "Knowledge Management", http://www.knowledge-management-online.com/knowledge-associates-international-km-definition.html.
[4]. "KM Overview", http://home.att.net/~discon/KM/KM_Overview_Context.htm.
[5]. "What is knowledge management?", The Knowledge Management Forum, **(1996)** March, http://www.km-forum.org/t000008.htm.
[6]. M. Stankosky, Keynote address to ICICKM (International Conference on Intellectual Capital, Knowledge Management and Organizational Learning), **(2008**), pp. 9-10.

[7]. E. Lesser and L. Prusak, "Preserving Knowledge in an uncertain world", MIT Sloan Management Review, vol. 43, no. 1, **(2001)**, pp. 101 – 102.
[8]. A. Abell and N. Oxbrow, "Competing with knowledge: The information professional in the knowledge management age", Library Association Publishing, London, **(2001).**
[9]. J. Ranjan and S. Khalil, in Application of Knowledge Management in Management Education: A Conceptual Framework, Journal of Theoretical and Applied Information Technology, Islamabad, vol. 3, **(2007)**, pp. 15-25.
[10]. R. Ruggles, "Knowledge tools: Using technology to manage knowledge better", Butterworth-Heinemann, Boston, **(1997)**.
[11]. K. Wiig, "Knowledge management foundations: thinking about thinking", How people and organization create, represent, and use knowledge, TX: Schema Press, Arlington, **(1993)**.
[12]. K. Dalkir, "Knowledge Management in Theory and Practice", The MIT Press, London, **(2011).**

