

Knowledge Management Model for Hospital (A Case Study Approach: Focus on Knowledge Gathering Process)

Yohannes Kurniawan, Johan

Bina Nusantara University

Jl KH Syahdan No. 9, Kemanggisian, Jakarta Barat, Indonesia

+62 534 5830 (ext. 2207)

ykurniawan@binus.edu, johanj@binus.edu

ABSTRACT

Currently the health services become one of the major problems in Indonesia, particularly related to the primary services provided by the hospital. The problem that often occurs in Indonesia hospitals is the high number of malpractice, the problems makes public confidence for the hospital is lowered. Suspected problems related to the performance of hospital services is closely related to social interaction capabilities among medical and paramedical personnel, knowledge leadership, the characteristics of information technology and knowledge management capabilities at the hospital; The design of this study will reveal the role of social interaction capabilities, knowledge leadership, and information technology characteristics on the performance of hospital care through knowledge management capabilities. The population in this study is a hospital located in Jakarta, where the respondent is the hospital leaders, medical staff, and paramedics. The ultimate goal of this research is to produce a framework strategy to improve knowledge management capabilities at the hospital to focus on the factors that influence the performance of hospital services in Indonesia, especially in Jakarta. And the results of this research showed social interaction capabilities, information technology capabilities, and knowledge leadership is the most important factors for the hospital to improve their knowledge management capabilities.

CCS Concepts

• Information systems~Blogs • Applied computing~Document management and text processing

Keywords

Knowledge Management; Hospital; Information Systems; Hospital Services Performance

1. INTRODUCTION

Indonesia is the fourth largest population in the world, after China, India, and the United States (World Bank, 2012). Based on data from Indonesian Center Bureau of Statistics, showed the Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

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population of Indonesia is 206,264,595 in 2000, when the Indonesian population census in 2013 showed the number is 249,865,631 [1].

Based on the data recorded by the Ministry of Health in 2000, the number of hospitals in Indonesia is 1,145. And in 2001 it has increased to 1,179, with details of 598 units of public hospitals and 581 private hospitals. Hospital has developed very rapidly in the decade (1988-1997), from 287 to 581 hospitals. Based on data from the Ministry of Health, the number of hospitals in Indonesia has reached 1,959 units in May 2012.

Basically hospitals can develop knowledge management (KM) capabilities to support operations for medical and non-medical services. This study provides attention to the relationship among social interaction capability and IT capability to support hospital knowledge management capability.

Knowledge management has proven its role in the business world. But from the facts as well as some observations that have been made and published, the application of knowledge management systems in the medical field is underdeveloped. So far the implementation of knowledge management systems in the medical field is limited only to administration of patients in private practice, clinics, and hospitals. This paper explores the concept of knowledge management in the clinical areas that are expected to provide tangible benefits to the clinician for the diagnosis and treatment of patients.

Knowledge management for hospitals is a systematic approach to manage the information and knowledge that are used to create or increase the value of services. Implementation of knowledge management related to the component of knowledge management, i.e. knowledge management phases and the scope of use of knowledge management. This components include the management of the technology used, processes or activities that supported knowledge management, and human resources that utilize and manage knowledge management. While the stages of knowledge management related to the activities of creating, collecting, and disseminating knowledge [2].

In order for knowledge management systems that are implemented in hospitals, it can actually deliver tangible benefits to clinicians. So the systems should be designed based on the flow of work and thinking clinical (clinical pathways) were performed as a daily physician for providing medical services to patients. A system analyst or an expert that will design the information systems of medical information should understand the clinical methodology used by the clinician for making a diagnosis. Clinical methodology is a study of ways of thinking and working physicians for achieving the goal of patients cured or at least reduced suffering. And this paper will propose the concept of a

knowledge management systems that can help to implement information technology in the medical field effectively.

2. METHODS

The model has been designed through blended process of literature reviews and provides a quick reference for the stakeholders in hospital to improve their work. This model is extracted, combined and modified in conformance to the real situation; the model will be re-evaluated based on feedback received during the case studies. This model has become an effective approach for dealing with the inherent complexity of large distributed systems, and its more better than traditional model because a view in the model is a representation of a whole system from the perspective related to set of concerns. The method used in data collection was reviews from the literature and questionnaire. The research model has been validated by KM experts and also have been validated through a questionnaire distributed to 33 hospital administrators in Indonesia (the respondent is the hospital leaders, medical staff, and paramedics). The questionnaire consisted of series of questions related organization structure, culture, IT policy, human resources, information infrastructure, incentive program, expertise development, and knowledge management cycle. This research will explore further how the relationship between role of social interaction capabilities, knowledge leadership, and information technology characteristics relate to each other and whether the knowledge management capabilities as an intervening variable has implications on the performance of hospital services in Jakarta.

3. RESULTS AND DISCUSSION

To initiate change, KM must be integrated with medical processes in hospitals. The technology enables and provides all the infrastructure as a tools to support KM in the hospital.

The basic idea of KM, in the beginning, is related to knowledge management in a related activity [3]. This includes organizing, sharing and use of knowledge to create value and achieve competitive advantage for an organization. While knowledge has become a major topic of debate in philosophy and epistemology since the time of Plato and Socrates, it is claimed to be one of the latest ideas in management, the idea of capturing knowledge gained by individuals and spreading it to others in the organization [4].

Some literature generally states that the process-based approach can affect the performance of the KM process capabilities where the link between knowledge resources that is influenced by the characteristics of the knowledge and performance of knowledge management (KM) itself. According to the standpoint of the concept of knowledge-based, performance of KM is affected from knowledge resources, including knowledge capabilities characteristic. Furthermore, when viewed from the perspective of the concept of dynamic capabilities, it can be observed from the interaction between knowledge characteristic features and capabilities contained in hospitals in Indonesia. In this study the performance of KM in general is defined in the performance of patient care. Based on the views of dynamic capability and the mediating role of process capability, this research proposes a research model to explore the processes of KM of the professionals in hospitals in Indonesia, which basically consists of three main components: the interaction between knowledge acquisition strategy hospitals, IT characteristics, knowledge leadership and KM capabilities, and the performance of KM at a hospital in Indonesia.

We proposed conceptual framework to provide a comprehensive understanding of the role of KM for increasing the hospital service. The framework provides an understanding of KM and its will give the added value by demonstrating the mechanism of the link between KM and IT, KM capabilities and performance of the services that can lead to give the added value for the hospital. Framework in figure 1 shown the illustration of knowledge management based on a conceptual interpretation of the findings from previous empirical work. KM capability is recognized as an important component to be included in this model, as illustrated in Figure 1. Moreover, these variables included of an important part of improving services at the hospital. Utilization of knowledge management is closely related to the ability to support KM. KM measurement approach should include both subjectivity and objectivity to negotiate the implications of the multidimensional nature of the added value. Measurement model is not considered as a barrier, but congruent with justification of the added value based on logical understanding and interpretation of the hospital. The main concern is to identify the added value resulting from the performance of KM in a hospital.

And based on previous research, a conceptual framework consolidated the performance of business processes and learning and growth performance (especially in terms of research in the Hospital). Figure 1 illustrated interrelated mechanisms between KM enabler with a balanced view of the KM capability into a single framework. This research is motivated by the gap between the theory and practice of KM identified in the recent literature of KM. IT as a foundation of KM is very important for the organization [5]. Using a variety of IT applications to support the achievement of KM will essentially contribute to the creation of an organization's knowledge. The relationship between KM and IT is very relevant. Meanwhile, according to Asoh [6], as an enabler for KM, IT is considered as the technical function aspect that will serve as a component that needs to be aligned with KM to improve the performance of KM.

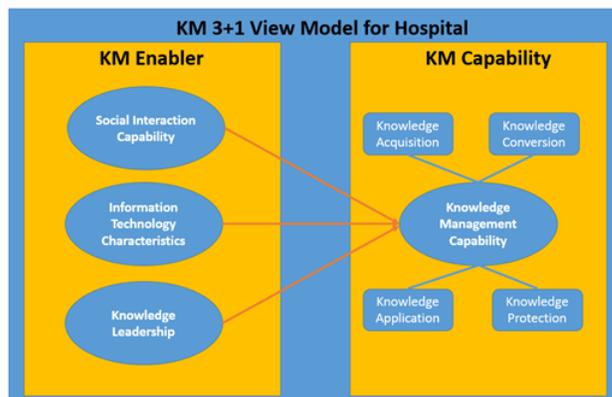


Figure 1. KM 3+1 View Model for Hospital

Social interaction capability and knowledge leadership are recognized as an important component to be included in the framework, as illustrated in Figure 1. A KM capability is widely accepted and important as criteria to measure the result of knowledge management efforts. It can be clearly seen that the results cannot be identified without criteria. Structuring a set of criteria for knowledge management is very important and appropriate for an organization [7]. Similar to a project that needs to meet a set of criteria that must be selected, KM projects can

also be evaluated through a set of criteria [8]. Thus, organizations especially hospitals should establish metrics related to the performance and criteria of KM. In the model of this study the authors added a new variable, namely knowledge leadership and information technology characteristics in research, which is one point of novelty of this study.

KM in the perspective of ability is basically to be consistent with the perceived ability, it is widely expressed in the strategic management literature, where it is seen in terms of the processes and infrastructure that used by an organization to transform inputs into desired outputs [9].

KM is seen as strategies that create, acquire, transfer, consolidate, share, and increase the use of knowledge in order to improve organizational performance and survival in a business environment. This scenario is a challenge for organizations in managing their knowledge [10]. Therefore the specific plan and the appropriate tools will guide the process of knowledge management [11]. And basically knowledge intensive organizations need to update the internal knowledge to improve their organization potential, especially for the medical and paramedical personnel in hospital, they need to continuous learning to improve their competencies [12]. And by supporting of information technology, it will help the organization to improve their speed of learning process [13].

Establish criteria for measuring the success of knowledge management is very important because it creates the foundation to evaluate and assess the value of its results [8]. The findings suggest that the overall knowledge management capabilities, such as composites associated with knowledge management performance. Therefore decomposed models offer insight into the relationship at the level of dimensions that are not easily inferred from the composite model. This study offers a useful insight into the performance of knowledge management. There have been several studies that decompose the effect of knowledge management in relation to organizational performance. Results indicated that the approach is less useful for understanding the complex relationships in the knowledge management performance. The authors have developed an analytical and conceptual model of KM capability to organizational performance begins with (Acquisition Knowledge, Knowledge Conversion, application, and knowledge protection) based on a thorough investigation of the various models presented in the literature KM.

Beside the knowledge management conceptual model showed in figure 1 as a basic concept to implementation knowledge management process in the hospital. This paper focus on the process how to gather explicit knowledge from the experts in the hospital. In order to improve explicit knowledge in hospital by increasing the dimension of externalization based on Socialization-Externalization-Combination-Internalization model (SECI Model) by Nonaka and Takeuchi is needed a knowledge management system that is integrated with electronic medical record. Examples of externalization that can be improved by medical personnel, such as:

- Making the case study of Evidence based Medicine (EBM) process, approaches to medical practice is intended to optimize decision-making by emphasizing the use of evidence from well-designed schemes and research / experience. Despite all the medicine based on science have some level of empirical support, EBM further will classifying evidence of the strength of epistemologic and require the strongest type (derived from meta-analyzes, systematic reviews and randomized

controlled trials) that can generate a strong recommendation; As for the weak types (such as from case-control studies) that can produce a recommendation that is not too strong medically. This approach will emphasize the use of evidence for the design guidelines and policies that apply to groups of patients and populations ("the practice of evidence-based policy")

- Knowledge mapping, it will help to identify the essential knowledge needed by medical activities in hospitals to support the core business processes. And the results of knowledge mapping is knowledge folder that contains important detailed knowledge (best practice). Two important things are the basis for preparing the knowledge map is a core business process and job activity. The knowledge map created based on the document data in hospitals and input from subject matter experts in hospitals (those who have knowledge (knowledgeable) and experience).
- Documentation knowledge of hypothetical analysis prior to medical decision-making in the process of early diagnosis, examination, and differential diagnosis. Because all this is documented in the medical record is a fact and medical decisions.

One effort to improve the externalization is the encoded approach to the representation of the guidelines in the Electronic Medical Record (EMR), as an interface standard terminology. Clinical guidelines encoding methods can be used to support the medical coding process and to be used in primary care settings, outpatient facilities in hospitals. Medical coding that can help to improve the quality of explicit knowledge is CPT, HCPCS II and ICD-9-CM. It can be used to support the patient's medical records and translate the narrative notes into useful medical code. Code for the narrative, it can make ambiguous or confusing, this can be accomplished through the development of a network with the peers in the medical and paramedical or online forums (Figure 2).

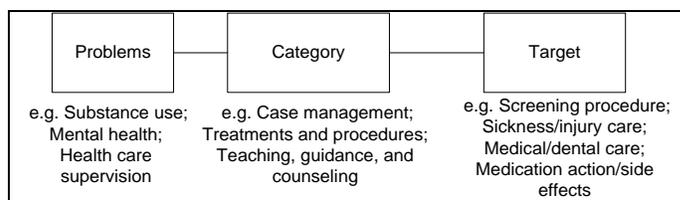


Figure 2. Knowledge Management Codification Process

Systems needed is not just focusing on the documentation process, but stressed also on the search process that is already contained in the knowledge repository knowledge (if they already have EMR systems) as a tools for the medical and paramedical personnel to improve the quality of medical decisions in the hospitals (Figure 3 and Figure 4).

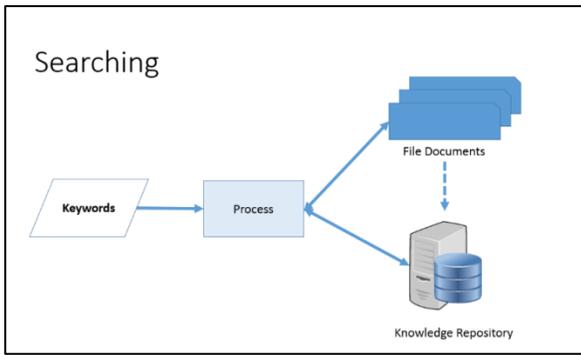


Figure 3. Knowledge Gathering Process (Overview)

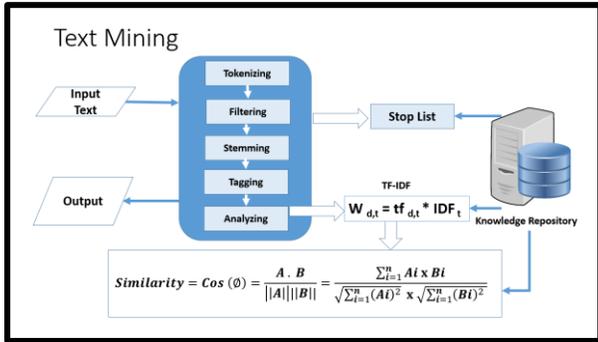


Figure 4. Knowledge Gathering Process (Detail)

A deployment view models to develop the run-time architecture in the knowledge management system for hospitals can be seen in Figure 5 and 6. It shows the configuration of the hardware elements (nodes) and shows how software elements and artifacts are mapped on those nodes. The Physical View uses UML deployment diagram notation, describe the structural elements of the system in general that are used to represent physical nodes deployment (system environment). Deployment diagrams in the conceptual model for KM depicted to describe web-based system model that display the system's execution environment (hardware / software platforms).

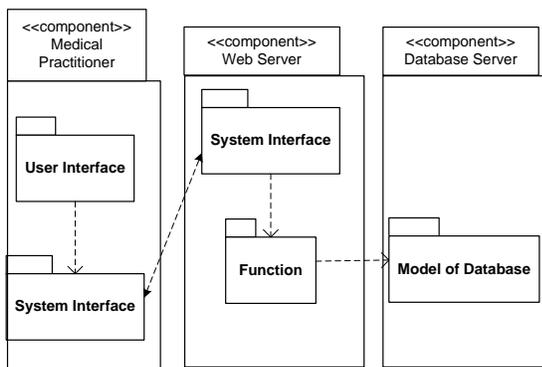


Figure 5. Component Diagram

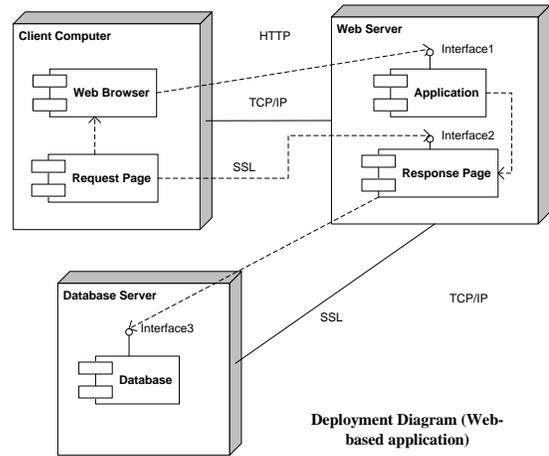


Figure 6. Deployment Diagram

4. CONCLUSION

On this study, we defined the process in the acquisition of knowledge outside the hospital (university or research of pharmaceuticals) and internal knowledge creation called a knowledge acquisition (in the model). Basically hospitals can develop KM capabilities to support operations both medical and non-medical services. Interest in the ability of the organization has created focus on the development and implementation of KM processes and infrastructure (social and technical) that needed to support the work of professional practice in hospital every day. This study provides attention to the relationship among KM acquisition strategy, KM capability (infrastructure and social), criteria for measuring KM and KM performance. We hope it intrigues researchers to clarify the important relationship among strategy (KM and IT), capability of KM, IT performance and measures of KM performance, and leads to more comprehensive investigations.

The model has been designed through blended process of literature reviews and is an attempt to establish a measurement tool with the intention of being able to measure the KM capability of organizations and provides a quick reference for the stakeholders in organization to improve their work. This model is extracted, combined and modified in conformance to the real situation; the model will be re-evaluated based on feedback received during the case studies, although no changes will be made to the conceptual model. However, some factors might be prioritized aligned, clarified that exists in practice. Testing and modifying the model requires to extensive analysis of information acquired during case studies. And for the future work the data mining techniques can be adopted to identify the patterns of high performance KM activities to plan the performance improvement strategies in the future. One direction for future research is related the quantitative performance with financial value that is will more informative to the top stakeholders.

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