

TOWARDS AN INSTITUTE OF TECHNOLOGY: A KNOWLEDGE MANAGEMENT SYSTEM CHALLENGES IN THE PERSPECTIVE OF ACADEMIC AND STUDENT ADMINISTRATION BUREAU

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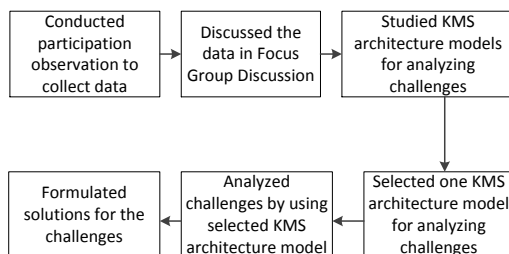
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Graphical abstract



Abstract

Nowadays, Knowledge Management System (KMS) can be used in higher education as a strategy framework reflecting the comprehensive and integrated understanding with long-term paradigm to attain institution mission. KMS practices require long processes, management processes, human resources, information technology and communication which holistically constitute the valuable assets in sharing information, knowledge, and experience to achieve the effective knowledge management. One strategy to KMS involves continuously implementing sharing information, knowledge, and experience supported by information system as the holistic effort for organization development. This study aims to explore the challenges faced by the transformation of a higher education institution process from polytechnic into an institute of technology, particularly in the working area of the academic and student administration bureau. The main focus of those challenges is of KMS perspectives to become part of the organization's culture. The exploration elaborates the concepts of KMS and compares them to the organization conditions.

Keywords: Transformation; challenges; polytechnic; institute; knowledge management system

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1.0 INTRODUCTION

An institution may change in terms of organizational structure and business processes that result changes in the standard operating procedures and knowledge administered by the organization. This situation may happen to Higher Education Institution (HEI) in Indonesia. In Indonesia, a higher education institution can change and become an academic community, college, polytechnic, institute or university according to the forms, status, and study programs as written in

Government Regulation of the Republic of Indonesia Number 4 Year 2014 on the Implementation and Management of Higher Education. This study explores the transformation from a HEI of polytechnic of informatics into an institute of technology.

An organized and systematic approach to determine the expected direction and process of education is highly required in the management of HEI that has changed and developed into an institute. Basically, this approach aims to utilize knowledge in the implementation process assurance, mapping skills,

and developing competition, innovation and creativity, communication process among stakeholders, the development of institutional culture, learning culture either at the administrative academic level or at the tactical and strategic level.

Meanwhile, a HEI has a significant role to administer the implementation, management, utilization, planning and development of higher education. To harmonize the management and other functions, Knowledge Management System (KMS) is required in the operational implementation of HEI. KMS is defined as an elaboration of the concept of Knowledge Management (KM) which is identified in the form of devices (tools) used to manage data and information from an institution. KMS is characterized by sharing knowledge culture among individuals, units, bureaus and groups. This culture is created in knowledge creation, in which every individual having ideas will communicate, select and disseminate to the related units so that each person in the institution not only share knowledge but also manage, create it continuously. Additionally, an example of KMS is described by Liao et al (2011: 140). Furthermore, Pinto (2012: 2080) elaborates a knowledge management framework that can be used to identify its supporting technologies, architecture, activities and practices.

This research describes challenges in the process of transformation of a polytechnic to an institute and focusing on knowledge management system. This study was conducted in the Academic and Student Administration Bureau (shortened to be BAAK) where the authors work. When the transformation of this institution happened, this bureau practically changed the job routines, documentations, transition and staff turnover. In addition, this bureau has identified that the use of KMS can help managing tasks, services and documentations, designing system for documentation management, initiating new thought or ideas in creating a management system, a new approach in service improvement. In other words, it is not only creating and maintaining knowledge but also evaluating the previous systems. As a result, it can be stated that the activities of BAAK in an institution has multilevel and continuous excellence needed to be attained. However, many challenges have emerged in KMS implementations that were discussed in this study. Additionally, this paper also describes KMS planning that can be applied in the BAAK.

This study was conducted using a qualitative method. Bungin (2007:115) states that a qualitative study comprises an observation process that can be divided into three different types - participation observation, unstructured observation, and unstructured group observation.

This study used a participant observation method in which data were collected through observation and participating directly in developing system and sharing KM in an Academic and Student Administration Bureau at authors' campus. A Focus Group Discussion (FGD) method was performed for data collection. This technique was used to reveal concept of KMS and the expectation of its development. To reach more

directed FGDs, this paper applied the KMS architecture model which was determined after completing review of literature. By applying the related information, the object of study can be categorized based on its function in the KMS. The observation and FGD processes will describe the challenges in this bureau in the process of transformation from a polytechnic to an institute in term of KMS applied. Using the data collected, some related solutions were offered to make the transformation process better. Thus, this study can be categorized as a development research which is regarded as a problem - oriented research.

2.0 ANALYSIS

The understanding and implementation of KM are important in higher education development. The role of KM significantly determines the transformation that an institution expects because knowledge and technology develop rapidly (Pee & Kankanhalli, 2015: 10). According to Melcalfe (2006: 24-25), the use of KM in an organization is a process of producing information and knowledge through the interaction of three components-human, process, and technology. KM as a capital organization focuses on organizing, classifying, and coding information into knowledge (Fernandez & Sabherwal, 2010:5) so that every individual in the organization can easily access the expected information. Technology has a role in enhancing KM as the key component in KMS.

The database is used as a device for storing information which describes human knowledge in an organization, such as regulations, priorities, knowledge, information, and decision. The knowledge stored is used in the organization activities such as identifying knowledge difference, in which every individual can access and share information.

The existence of technology can accommodate KM processes. In practice, the recorded knowledge was done using technology through the development of information systems. In this information system, the role of each user is differentiated and limited to each privileged role. One of the examples is academic and student data can be accessed by different users in the same time with the approval of relevant authorities. The database might be accessed by academic and non- academic staff. In information system, the data integration is required to combine two or more dataset for sharing and analyzing information and supporting KM for higher education development.

Using KM, HEI can systematically perform a process that increases the competitive benefits and implement a series of processes to identify, create, describe, and distribute knowledge that will be reused in that organization. Hansen et al. (1999:107) states that there are two ways to manage knowledge using strategy and personalization codification. KM in transformed institution applies the codification strategy in which the knowledge is codified and stored in database. In terms

of stored knowledge, as each term represents the level of "captured knowledge" comprehension (Leiw 2013: 49-50).

KMS provides a fundamental framework and standard for knowledge and smart-work system that can help the decision making process to achieve the right decisions. KMS gives opportunities to change weaknesses in improving knowledge management. Pinto (2012:2080) suggested a framework that can be used by HEI to implement KMS. In this study, KM-related challenges that emerged in the transformation of a polytechnic into an institute applied this framework as a guide. Each component in this framework was analyzed and compared to the conditions of a transforming institution.

3.0 DISCUSSION

3.1 Institution Transformation

KMS is a part of management system of higher education. In higher education, there are some units which each of them is responsible for their duties and responsibilities. KMS provides information access and reaches every individual and group to change and share knowledge in the management development of an institution. In addition, it encourages a shift in the group's behaviour and shows full involvement in finding the problem solutions. Senior groups share knowledge, information, and action to junior groups so that the updated and equal information can be accessed for the institute development.

The unit to be discussed in this paper is Academic and Student Administration Bureau (BAAK) at authors' campus. In developing KMS in BAAK, three

components comprising People, Technology & Processes cannot be separated (Savitri et al, 2013:60), Bhusry & Ranjan (2011:34). The term of People is defined as internal parties holistically managing not only staff but also the entire individual joining at organization. Technology devices are used as the tools in learning activities at the institute and information system developed by the organization globally. The influence of information technology development is expected to be able to compete adapting the development of technology. The process is regarded when people use technology and communicate back in the form of job performance. The correlation among these three components must be integrated in KMS of BAAK. KMS clearly functions to communicate and collaborate between individuals and groups. This system is precisely developed in BAAK.

The institute in this study was formally decided as a new institute at the end of 2013 that was previously in the form of a polytechnic. This polytechnic consisted of one faculty with three study programs (Informatics Engineering, Informatics Management, and Network Management) and has developed into three faculties with 8 study programs. The development of this institution increases the number of staff and lecturers which directly enhances the jobs and services of BAAK.

Process and service development systems in polytechnic are different from an institution. The significant difference lies in the increasing of human resources which requires the alignment in the process leading to excellence. KMS is expected to manage and maintain the system effectively and efficiently with quality assurance. The differences described are shown in this following table:

Table 1 The differences of polytechnic and institute.

No	Difference	Polytechnic	Institute
[1]	Form	Polytechnic; Diploma	Institute; Diploma and Undergraduate
[2]	Study Program	1 major: Computer and Informatics	3 majors (3 Faculties)
[3]	Students Body	300	850
[4]	Faculty/Staff	150	250
[5]	Infrastructure	1 Faculty	3 Faculty
[6]	Budget	Less	greater

In development of BAAK using KMS, the following are the issues that might be faced:

1. Organizational Change: From Polytechnic to Institute. This condition changed the characteristics and service model. Learning, adjustment, and service are required.
2. Organizational Development: The development and expansion of services as agents of change. Human resources directly involve as agents of change that work together with interpersonal, structure, infrastructure, facilities, culture and information technology.
3. Organizational learning: The observation of the phenomenon change, the process of learning

between BAAK and the other units at The institute, and the development of external relations.

4. Organizational Memory: A collection of data and information by Academic and Student Administration, not only as the archives but also learning sources and sharing of development in various fields. Through the data, the collaboration can be done for the development of the institute.
5. Organizational Intelligence: The emphasis is on the management of information to developing knowledge by encouraging all BAAK Staff to

classify and manage information into knowledge to improve BAAK service.

6. Organizational Culture: Creating working ethics that encourage every individual to understand the characteristics of information management, artifacts, service standards and information utilization for the improvement and development BAAK services.
7. Theories of the evaluation of organizations: The development of information system of academic and student services is one of transformation forms in BAAK. Students can access information systems through academic and student information system.
8. Human Resource Management: Human Resource in the development of BAAK is one of the priorities, in which planning stage form recruitment process, continuous workshops of BAAK staff becomes one of the important entities of knowledge management development.
9. Information processing approach: Approach from the perception, behavior, interpretation produces the same knowledge on the development of BAAK.
10. System Theory: Formulating BAAK service system to be one of service standards that can be managed as knowledge sources.
11. Artificial Intelligence: The use of technology and information in BAAK services is one of artificial intelligence entities. Technology is used as a means of knowledge development.
12. Strategic Management: Techniques and BAAK management skills will influence in KM.
13. Other Management Approaches: Focusing on service innovation, management transformation, service systems in BAAK.
14. Organizational Psychology: Organizational Psychology is very influential in the knowledge management.
15. Organizational Sociology: Relationship and communication in BAAK are the efforts in KM development.

Therefore, it is concluded that people in BAAK learn and become a part of a learning community, self-adjustment, service excellence improvement that every individual obtains job satisfaction. Process shows that the effort effectiveness and efficiency can add the values of services and the functions of BAAK. One of the reasons for the application and KAM development in BAAK is to enable knowledge and information more effectively used by every individual in BAAK so that: "sharing knowledge practice" can work well and be easily accessed. KMS has a role in grouping knowledge in which technology has an important role in the processes of grouping and data storage or the knowledge itself.

3.2 Challenges

The advancement of Information and Communication Technology is the biggest challenge in KM. It functions to manage, plan, document, lead, asses, and improve the innovation and creativity in BAAK services. The first challenge lies in the effort to equalize the knowledge and perspectives of BAAK staff. It is considered important because everyone changes and the knowledge develops. A system to synchronize the perspectives on organization management of BAAK is highly required such as the system of submitting the scores, how far can BAAK staff access the course scores, or do the lecturers directly submit the grades into academic information system?. Another example is related to external service. This refers to what data or document should be communicated to external parties. The information needs to be communicated to the management system so all units or departments can understand the areas of BAAK services.

The next challenge is KMS strategies in BAAK. The strategies defined in this paper are how to develop, manage, evaluate, and disseminate information to the relevant units. Obtaining knowledge should be in line with the exact pattern using the regulations of document access. Communication is very crucial especially in terms of how to convey and determine whether the information is urgent or not, to what units it should be communicated and discussed. Creating an atmosphere of innovative and creative thinking has its own challenges without dismissing the cultural values, and vision and mission of the institute.

KMS described by Pinto (2012:2080) is explicitly required to formulate a strategy and organizational framework, mapping information and communication, infrastructure, logical thinking management, workflow management system, collaboration that finally produce a working system standard.

The formulated standard system will be considered as the knowledge and patterns for all stakeholders. For example, the existing knowledge system will be easy to follow when there is employee turnover without spending much time to inform him the systems. Using the framework formulated by Pinto (2012:2080), the details of challenges are described in this following Table 2.

Table 2 Transformation challenges.

Processes	Challenges
Knowledge Creation	In knowledge creation process, there is a significant change from the number of data, information and knowledge managed by HEI because of the increasing of the number of faculties and study programs at this institute, while there is no change in the corporative portals or web 2.0. The unit creating this system has limited resources and this KMS product has not implemented yet.
Knowledge Storage and Retrieval Knowledge Share	There was no clear knowledge maps at the time of transformation because no one possessed enough knowledge related to HEI. In addition, the e-learning system must be heavily modified to accommodate the addition and deduction of knowledge creation products. The processes of knowledge store, retrieval, and share are considered challenges because there are no clear standards of these activities.
Knowledge Application	Expert system and help-desk were not available when the HEI was a polytechnic and in transformation process. These two applications were not implemented. Thus, the challenge found is the complaints cannot be solved quickly because the historical follow ups cannot be tracked directly.

During the transformation from a polytechnic to an institution, KM infrastructure and technology are required to be developed in accommodating these changes. Capacity storage, email server, network connectivity must be expanded and measured to meet the expectation and the transformation can run well. Yet, in practice the resources for infrastructure development were limited so that the transformation process was not running as what expected. Problems come up such as the difficulty to access e-learning system or other documents.

The solutions may be offered for these challenges are encouraging all stakeholders from faculties, study programs, staff and lecturers, students' parents and students to understand the functions and the scopes of BAAK services; students can understand their roles to improve BAAK services; the perspectives on services must be synchronized in terms of the processes, outcomes, administrative services, etc. In addition, the development of information system connecting BAAK and students must be organized much better. The systems can be relevant to class, dormitory, self-study, student body activities. The quality assurance of BAAK services is important to be improved. The auditors are recommended from external parties to attain more objective assessment. The writers suggest that the identification processes of knowledge creation can use case and sequence diagrams.

The next solution challenge is the database merging of the units in BAAK which is centralized and accessible. This requires a consultation service that serves as an interface to connect the different expertise or colleagues in the same units that learn, share knowledge, improve professional supports, communication of individuals or groups to create a working culture. The level of knowledge complexity and understanding particularly in routine works in BAAK that show the need for higher KMS based knowledge.

4.0 CONCLUSION

KM best practices in higher education explained in this study contribute some opportunities and challenges. Every individual has different expertise which is a valuable asset for an institution. The existence of the different knowledge and skill acquires sharing knowledge and experience through information technology. The more the knowledge is shared, the more its value brings. This is to say, the knowledge value will be more perfect when it is shared. The simple example is the information and knowledge shared in a forum discussion will add the brilliant ideas for knowledge development. Technology facilitates management to share knowledge and information and supports in information filtering. The information shared depends on the institution needs. Thus, the role of technology in filtering information is considered crucial.

The opportunities described before provide some challenges. The moral challenge is realized through the fear of plagiarism. Many people are afraid that their works or ideas will be copied for a commercial purpose. Information Technology solutions transmitting information and data in computers are available to change the perspectives of institution management. The example of globalization competition in an institution is described as knowledge enterprise and knowledge server. The knowledge enterprise constitutes the collection of knowledge and information. Due to benefits of KM, an institution must be able to create, store or maintain, share, disseminate, and apply information and knowledge. Therefore, the efficiency and effectiveness of institution management depend on the KM management.

KM Practices and Strategies can be utilized to: [1] implement integrated data system. [2] Facilitate learning activities for all stakeholders. [3] Develop institution quality, especially for the development of graduates and collaboration with other institutions. [4] Encourage each educational practitioner to act with integrity and reflect towards information and knowledge. [5] Promote the continuous learning. [6] Enhance the effective processes and strategies of KM in higher education.

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