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ROLE OF ORGANIZATIONAL AND TECHNOLOGY IN KNOWLEDGE MANAGEMENT INITIATIVES

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19.1   INTRODUCTION

Nowadays companies had considered knowledge as one of the most critical asset. They realize that asset should be managed effective and efficiently to get great value from it. Companies should be focused on how knowledge is managed. Davenfort and Grover (2001) note that the way company manage their knowledge (Knowledge Management) becoming a vital integral business functions. Practitioner faced the challenging task of deciding the way they manage knowledge in their knowledge management initiative.

In order to implement effective and efficiency of knowledge management (KM), organization needs to consider developing or buying Knowledge Management System (KMS). KMS is an IT system to support KM activities in organization (in this chapter we use KMS term in the same terminology with IT/technology in KM). KPMG survey in 2000, noted that most of organization in Europe and united states have at least considering adopt and implement KMS. In addition only 7 percent of that companies mention technology as a barrier for successful of knowledge management initiatives.

In KM initiative not only technological became challenges, non-technological problem have been identified as main barriers in knowledge management initiative such as, employee don't have enough time to share their knowledge, they don't feels will get benefit from doing so, and employee afraid to share their knowledge, because they believed their knowledge is their personal competitive advantages. If employee did not want to share their knowledge it means they would not use KMS as tools for knowledge sharing. When employee did not have intention to use KMS, the mission of KMS to support leverage knowledge would be fail.

Considering the complexity of KM initiatives, because of technological and non technological aspects, practitioner should decide the art of KM initiative appropriate solution to bring KM success, through deep understanding of both challenging aspects.

19.2   KNOWLEDGE MANAGEMENT INITIATIVE

KM initiative related with the approaches and the programmers that company doing to achieve KM mission in one organization. Practitioner should able to identify the component and process that support KM initative success, so practitioner can decide about approaches to KM that may suit their situations and appropiate technology in support that approaches.

19.2.1 Data, Information, and Knowledge.

Nowadays, Knowledge becomes critical asset for organization. But what is knowledge it self sometimes cannot be understood clearly by members of organization. Few definitions about knowledge need to discuss and combine with few related elements such as experiences, interpretation, information, and action.

One of the interesting definitions of knowledge came from Davenport and Prusak (1989); they define knowledge as a fluid mix framed experience, values, contextual information, and expert insight. Knowledge is different from information and data because knowledge has strong relationship with action and experiences. Another understanding of knowledge came from McDermott [8]; he argues that knowledge always involves people who behave the knowledge. Knowledge is about thinking of our mind, use information together, reflect on our experience, generate insight, and use the insight into solution.

So it means knowledge is a human nature. Knowledge belong to people, and it unique for everybody, because not exactly people have the same experience in their live, so how they reflect the information to take action for solve the problem will depend on their personal experience and the way of thinking.

Nonaka categories knowledge in two types, Tacit and explicit knowledge. Explicit knowledge can be expressed in words, numbers, or sound, and shared in the form of data, scientific formulas, visuals, audiotapes, product specifications, or manuals. Explicit knowledge can be readily transmitted to individuals formally and systematically. Tacit knowledge, on the other hand, is not easily visible and expressible. Tacit knowledge is highly personal and hard to formalize, making it difficult to communicate or share with others.

19.2.2   Knowledge Management

To be success in KM initiative, organization should decide and planning how knowledge is manages. Knowledge as critical asset in organization needs to be managed effectively; how the organizations manage their knowledge is known as knowledge management. Knowledge management refers to changing corporate culture and business procedures to make sharing of information

possible. Bhatt [3] argues that knowledge Management is a process of knowledge creation, validation, presentation, distribution, and application.
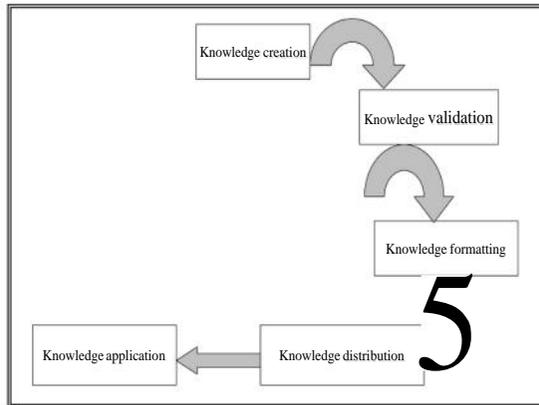

Figure 19.1 Knowledge Management Process activities
[3]

Knowledge creation
Knowledge is created when interaction among people or organization occurs. Nonaka believed that an organization can create and utilizes knowledge through converting tacit knowledge, and vice versa. He proposes SECI model to figure four modes of knowledge conversion, which can be described as follows:

1. Socialization: When tacit knowledge transfers from one individual to another by sharing and creating through direct experience.
2. Externalization: articulating tacit knowledge from individual through dialogue and reflection to members of group in one organization.
3. Combination : systemizing and applying explicit knowledge and information
4. Internalization: Learning and acquiring new tacit knowledge in practiced. It occurs from organization to individual

Figure 19.1 **SECI Model**
(Nonaka & Takeuci, 1999)

Knowledge validation

It is important for organization to continually monitoring, testing, and refining the knowledge. The reason is to always keep the knowledge up-to-date and fulfill organization requirement. Knowledge validation refers to extent to which a firm can reflect on knowledge and evaluate its effectiveness for the existing organizational environment [3].

Knowledge presentation

In general an organization may devise different procedures to format its knowledge base. The knowledge presentation will allow individual in organization get their best way to use and apply the knowledge. The organization should consider the way organization present the knowledge [3]

Knowledge distribution

To make knowledge applicable to use by individual, organization should manage how knowledge to be disseminated [3]. Organization should have effective strategy in order to distribute the knowledge; knowledge can be distributed if there is interaction between people, technology, and techniques. Bhatt found there are two commons barriers in distribute knowledge such as organization
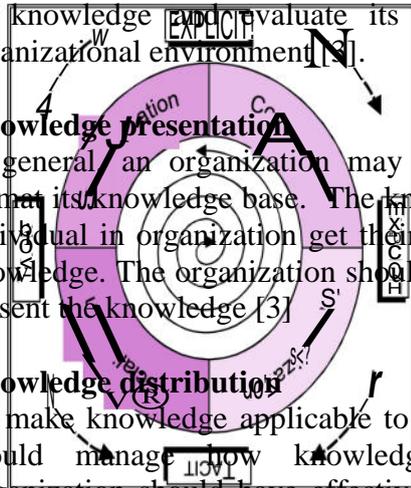
structure and supervision and fixed channel of knowledge distribution.

Knowledge application
Once knowledge applied in organization, it will embed in organization procedures, norm, daily activities, products or services. Knowledge is implicated if it creates value in organization [3]

19.2.3   Knowledge Sharing

Knowledge Sharing (KS) became popular topic in KM initiative. KS is main activities of KM process, without KS organization would not able to leverage the knowledge and KM initiative will not be success. Barthol & Srivastava [2] defined knowledge sharing as individuals sharing organizationally relevant information, ideas, suggestions, and expertise with one another.

The knowledge share by individual can be explicit or tacit. How explicit and tacit knowledge share is different, explicit can be share via verbal communication, while tacit through socialization, observation and apprenticeship, sometime tacit knowledge can be communicated by metaphors, stories, analogies or slogan [9].

Barthol proposed four mechanism for knowledge sharing in organization:
- Employee contribute his/her knowledge trough organization database/repositories
- Employee sharing their knowledge in formal interactions belong members of communities
- Employee sharing their knowledge in informal interactions among individual, group or team works.
- Sharing knowledge within communities of practices.

19.3 ORGANIZATION IN KM INITIATIVE

In an Organization, people and management always became key factors that contribute to organization success. In this part we will focus to discuss about people and management in KM initiative.

19.3.1 Role of People in KM Initiative

People became key factor of KM initiative success. The main issues of people in KM is how people contribute active in knowledge sharing, without people intention to KS, KM initiative will means nothing. The challenge is how people have culture need by KS.To develop KS behavior to employees, organization should bring new culture. Many scholars believe culture that values creativity continues improvement and the sharing ideas is necessary for KM initiative.

 It is important for us understand the role of people/employee as actors in KS. Employee who works in organization that implement KM recognize as knowledge worker, knowledge worker who contribute their experiences to communities known as knowledge contributor, on the other hand knowledge worker who use or reuse the organization knowledge known as knowledge seeker.

People who as act as knowledge contributor have special characteristic. They are usually have good motivation to help others, and expert in one area. Employee would not share what they know to others people in communities if they did not understand the benefit of doing so, or because they did not have enough time and effort to share their experiences.

As well as knowledge contributor knowledge seeker also have unique characteristic/habits in KM activities. Knowledge seeker habits such as have good motivation to learn something new, have good motivation in explore new method/procedure. Some knowledge seeker barriers are they don't have time to doing it, too

busy to finish job in office, and they did not get support from organization to explore the new method or procedure.
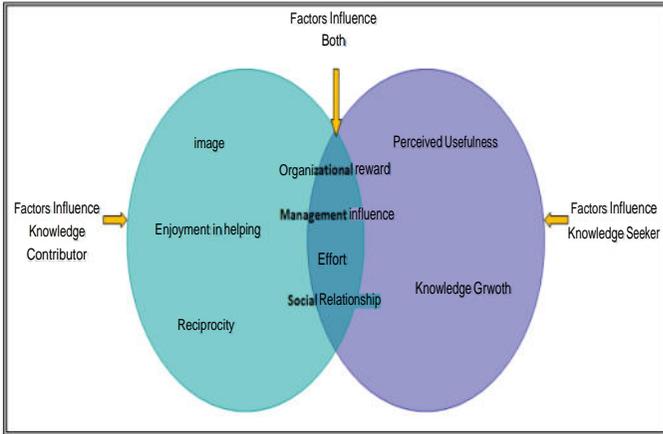

Figure 19.2　Factors Influence Knowledge Sharing
[6]

Figure 19.3 show the factors that influence knowledge worker in KS. There are some different perspectives from knowledge worker when they act as contributor and seeker. When they are act as knowledge contributor, the factors that influence them are image, enjoyment in helping, and reciprocity. Image is defined as the perception of increase positive reputation due contributing knowledge Enjoyment in helping others is defined as the perception of pleasure obtained from helping others through knowledge contribution. Reciprocity is defined as the benefit expectancy of feature request for knowledge being met as a result of the current contribution.

But when they act as knowledge seeker, the factors influences them are, perceived usefulness, and knowledge growth. Perceived usefulness is defined as the degree to which an individual believes that knowledge seeking in KMS would enhances his or her work performance Knowledge growth is defined as the knowledge seeker's perceived benefit of enchantting his or her own learning

experiences.

Figure 19.3 also inform us that there are some factors that have influences both of knowledge worker, as well as they act as contributor or seeker. First, Organizational reward is defined as the importance of economic incentives provided for knowledge contributors. Second, a Management influence is defined as degree to which an employee perceived that the management believes he or she should contribute or seek knowledge via KMS. Third, Effort is define as degree of energy associated with knowledge contributor or seeking behavior in term of time and exertion required. And Fourth, Social relationship is defined as individual perception of other KMS users (supervisor, subordinates, and peers) with whom the person has social.
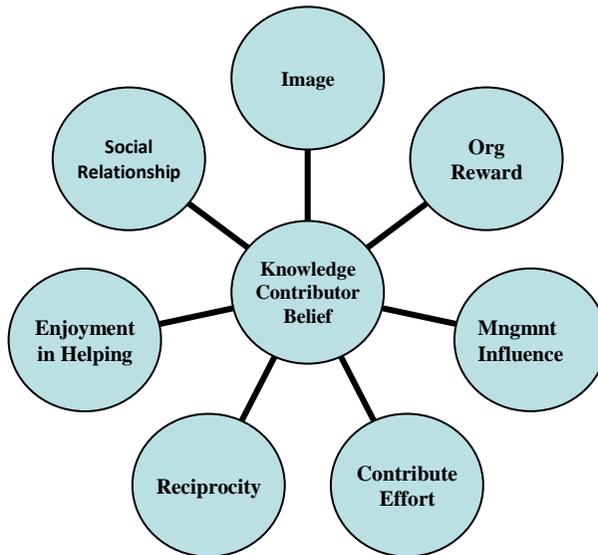
Figure 19.4   Knowledge Contributor Beliefs in KS
[6]

The each factor that influences the knowledge worker builds their own beliefs in KS as main activities of KM. The consequent is they

have some different and same perspectives in KS as shown in figure 19.4 and 19.5.
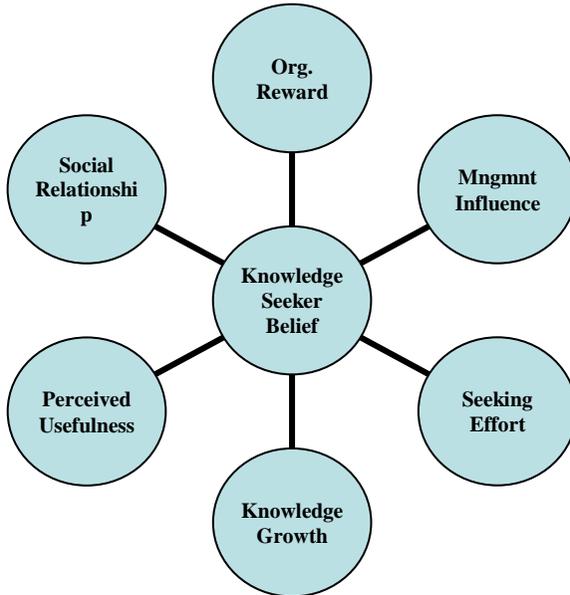

Figure 19.5   Knowledge Seeker Beliefs
[6]

19.3.2 Role of Management KM Initiative

Researcher believed that management in organization can manipulate the organization environment by intervention them. They believed Intervention is best approaches way of management to support KM initiative and achieve KM mission.

Cabrera [4] argue that three potential solution organizational interventions that may increase the employee participant in KS programmers. First restructuring the Pay-off function, increasing the perceived efficacy of individual contribution, and establishing group identity and promoting personal responsibility.

Organization can restructure the pay-off function through decrease the perceive cost of contributing, if the cost low than employee will motivate to share. Organization can provide enough time for employee to explore or contribute their knowledge. Develop user friendly information system and give easy and enough access to knowledge recourses also believed encourage employee to share their knowledge. Organization also can develop reward system for motivate employee for knowledge sharing, reward can be as financial and non financial.

19.4 TECHNOLOGY IN KM INITIATIVE

Today there is a different view from business and academic related to knowledge management implementation in organizations. Majority of business manager believe that technology such as Information technology is the key factor in KM success, however researcher and academician argues human, culture, and motivation (social system) became the key factors.

Recent research found that knowledge management is best carried out through the optimization both of technological and social system. It is because IT can manage and distribute information effectively and efficiently but IT poor in interpretation information into knowledge. However social system is best in conversion information into knowledge through social interaction. That why technologies and social system are equally important in knowledge management

19.4.1 IT Support KM Activities

IT develop to support organization in manage their knowledge through KM activities. KM activities include (1) knowledge creation, (2) knowledge validation, (3) knowledge formatting, (4) knowledge distribution and (5) knowledge application. Modern IT

to use of various form of information systems to support KM activities.

Table 19.1   IT Support in KM activities

KMS aspect	KM activities	IT support
Social System aspect : Communities interaction and collaboration	Knowledge Creation	Video conference, Electronic mail, group support system, intranet, Data warehousing and Data Mining, Document repositories, and software agent, electronic learning. *Not supported by IT*
	Knowledge validation	
	Knowledge application	Expert Systems Workflows system
Technological aspect: Managing Information/ Knowledge	Knowledge formatting	Knowledge displayed and store in various item such as, printed document, video recorded, disk, optical media, repositories, etc
	Knowledge Distribution	Electronic bulletin boards, Discussion forum, Electronic Learning, Knowledge directories

Today's, technology base IT system develop to support KM activities known as knowledge management system (KMS).

19.4.2   Knowledge Management System

In common, knowledge management systems (KMS) are IT that enables organization to manage effective and efficient knowledge. Alavi and Leidner [1] defined KMS as a class of information systems applied for managing organizational knowledge. In general KMS would not have many differences from other information systems, instead of content and activities by users.

Another perspective of KMS comes from Ericsson, F. & Avdic, A. (2004). They defined KMS as a system that increase organization performance by increase the better decision by employee when they use knowledge in daily work activities.

19.4.2.1   KMS as Socio-Technological System

There are different views of knowledge lead to different perspective on how knowledge to be manages. Alavi and Leidner [1] proposed three different view of knowledge, as object, process and capabilities.

First knowledge as object, it related with information access, the implication is the key of KM develop on building and managing information stock/information. If knowledge as process, it means KM should focus in how knowledge/information could be create, share, and distribute among employee in organization. And if knowledge is capabilities, KM will lead employee to build their competencies, skill, and produce intellectual capital.

These different views of knowledge has implication in how KMS to design. It brings us to considered three different views to be including in KMS mission. KMS should focus on knowledge as well as focus on people. KMS should has function/feature not only for managing knowledge/information but also to facilitate people to stay in touch, connect together, so they able to share and thinking together among communities [8]. KMS in other world should develop as socio-technological system.

Knowledge as object is very relevant with concept of IT function, as [3] argues that IT can handle data and information efficiently in KM, but IT poor in interpretation information to be knowledge. IT should connect together with people so the social system that needed to create and share knowledge happen. IT can support social system by provide tools for interaction among member of communities.
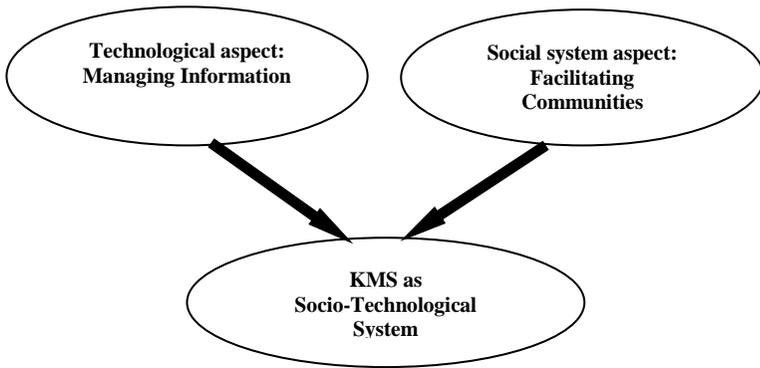

Figure 19.6   KMS as Socio-Technological System

Table 19.2   KMS Function in Socio-Technological Perspective

Managing Information	Facilitating Communities
• KMS help user assimilation of information • KMS has function as gathering, storing, and transferring information/knowledge • KMS provide effective search and retrieval mechanisms for information	• KMS provide access to sources of knowledge rather than knowledge itself • KMS should provide link among sources of knowledge to create wide breadth and deep knowledge flows • KMS enhances intellectual capital by supporting development of individual and organizational competencies

19.4.2.2 KMS Architecture

There are basically two ideal types of architectures of KMS:

centralistic KMS and peer-to-peer (p2p) KMS. Many KMS solution implemented in organizations and offered on the market are centralistic client-server solution [7].

Figure 19.7 shows an ideal layered architecture for KMS that represent centralistic KMS. This architecture consists of six layers, First layer is access services, and these layers transform contents and communication to and from the KMS to fit heterogeneous application and appliances.

Second layer is personalization services; it provides more effective access to the large amount of knowledge element. Subject matter specialists or managers of knowledge processes can organize a portion of the KMS content and services for specific role-oriented push services.

Knowledge services is third layer, this layer provide intelligent function of discovery, that is, the search, retrieval, and presentation of knowledge management element and expert; publication, that us the structuring, contextualization, and release of knowledge elements; collaboration, the join creation, sharing, and application of knowledge; and learning, the authoring that is supported by tools and tools for managing courses, tutoring, learning paths, and examinations as well as the reflection on learning and knowledge process established in the organization (commonly) referred to as double-loop learning.
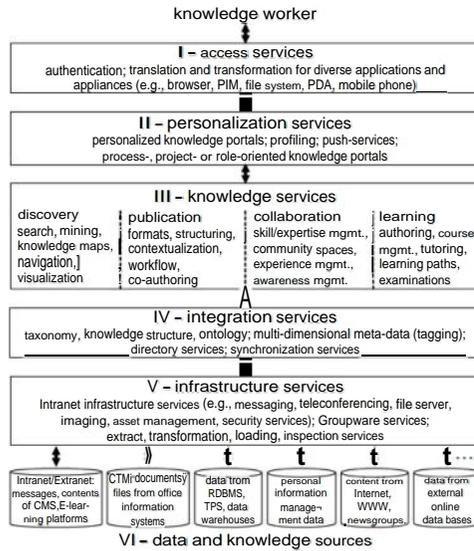
Figure 19.7 Architecture of a Centralized KMS
[7]

Fourth layer known as integration services. Integration services help meaningfully organize and link knowledge elements from many a variety of sources by means of ontology. They are used to analyze the semantics of the organizational knowledge base and to manage metadata about knowledge elements and users. Synchronization services export and (re)integrate a portion of the knowledge work space for work offline.

The fifth layer is infrastructure services, this layer provide basic functionality for synchronous and asynchronous communication, sharing data and document as well as the management assets. Extraction, transformation, and loading tools provide access to data and knowledge sources.

Last layer is data and knowledge sources include organization internal as well as organization-external sources, and sources of structured as well as semi structured information and knowledge.

Second type of KMS architecture is shows in Figure 19.8. Today's, the peer-to-peer (p2p) has got increasing attention from both academic and practitioner.
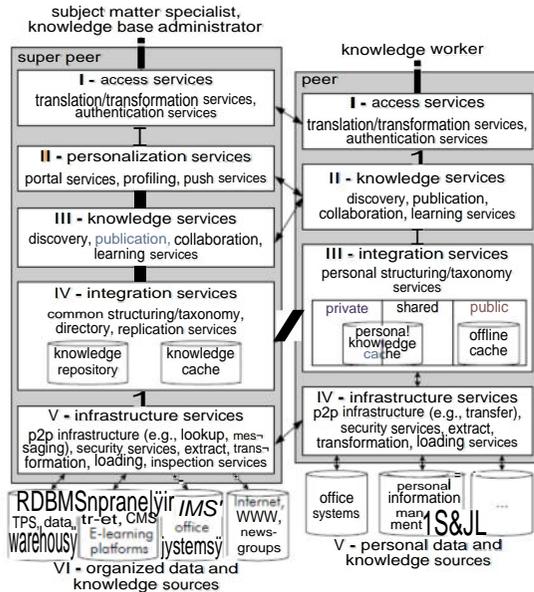

Figure 19.8   Architecture of Server and Peer
[7]

The differences between a single peer's architecture and the centralistic architecture are the following :

- Infrastructure services handle personal data and knowledge sources and provide the p2p infrastructure for locating peers, exchanging in data with other peers, and assuring the security of the personal knowledge base.
- Integration services handle the meta-data of knowledge objects in the personal knowledge base and establish a personal ontology. Private work spaces contain information that is only accessible by its owner. Private work spaces contain information that is only accessible by its owner. A public work space holds knowledge objects that are published via internet.

Protected work spaces contain knowledge object that are accessible by a single peer or group of peers that the owner explicitly grants access to.

- Knowledge services build upon the knowledge base, just as in the centralized case. The knowledge repository is now spread across a number of collaboration peers.
- Personalization services build on individual user profiles and centralized personalization services provided by server.
- Access services are similar to those in the centralized KMS architecture.

The different between a server's architecture and the centralistic architecture are the following :

- Infrastructure services enable a sever to access a number of additional shared data and knowledge sources. He provides services for lookup and message handling that improve the efficiency of the p2p infrastructure.
- Integration services offer a shared ontology for the domain handled by, for example a network of subject-matter specialists. This addresses the challenge in distributed KMS that the personal knowledge base cannot integrated without a mapping ontology. The server might offer replication services to peers that sometimes work offline.
- There are no central knowledge services in addition to peers' services
- Personalization services include profiles and push services that ease in accessing the organized collection of (quality-approved or even-improved) knowledge that subject-matter specialists administer.
- Access services are restricted to the administration of the server, the central knowledge structure, and the profiles for personalization.

There has been a shift in the perspective of KMS researcher as well as practitioners applying KMS that focus on managing document,

information/knowledge, and thus from pure codification strategy to combination and integration of function for handling internal and external contexts, etc [7]. Advanced functions supporting collaboration in teams and communities, tools linking knowledge contributor and seeker, and e-learning functionality have been integrated into many KMS. This trend has equal spirit with KMS as Socio-Technological system philosophy.

19.5   CONCLUSION

Considering the complexity of KM initiatives, because of organizational and technologyy aspects, practitioner should decide the art of KM initiative appropriate solution to bring KM success, through deep understanding of both challenging aspects. Suit approaches would bring KM intitaive to achieve KM mission

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