

# Discovering an Effective Knowledge Sharing in Organization Based on COWCLUS Cluster Approach

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**Abstract**—Knowledge management is activity process that can be used for maintain and increase the values of knowledge itself in organization. With knowledge management, organizations can capture, protect, retain, and maintain their critical knowledge. It can be used to increase capability of organization competence, to make an innovation and all important things for organization life cycle. There are indicators or parameters that describe a knowledge management process successfully implemented in organization. One of that is correlated with the activity of knowledge sharing within an organization, when it can do properly and iteratively. Knowledge sharing activity has a lot of issues, methodologies, frameworks, and models that can be implemented within organization. For the examples are communities of practices. They are used to make an easier way for organization, to deploy and develop knowledge sharing activity and all of it element in daily activities organization life. When knowledge sharing can be successfully implemented, it means knowledge management activity process can do properly also. It is because core element of knowledge management, is on knowledge sharing itself. COWCLUS cluster approach is used for discover an effective knowledge sharing in organization formulated with several literatures.

**Index Terms**—Knowledge management, critical knowledge, knowledge sharing, innovation, communities of practice, effective model, COWCLUS cluster approach.

## I. INTRODUCTION

Knowledge sharing activity, as the core element of knowledge management process, have methodologies, frameworks, and models that increasingly varied and interesting to be have researched. This is because the use of knowledge sharing can provide the good knowledge management process within organization.

When knowledge management does properly in organization, “treasure knowledge” or critical knowledge of organization can be stored. It can be formulated, so give competence capability to organization to make an innovation and all of important things to maintain organization life.

Knowledge management has become a critical component for maintaining competitive advantages. Many organizations

are exploring the field of knowledge management in order to improve and sustain their competitiveness. Faced with competitive dilemmas may be solved by the implementation of knowledge management to enhance competitiveness [1].

Organization life is depends on how it capture, protect, retain, and maintain their critical knowledge. To get this kind of knowledge, knowledge sharing must be done properly and iteratively. With the use of knowledge sharing, tacit or explicit knowledge can be captured and stored well. Knowledge sharing can do well within organization by establish the communities of practice.

Communities of practice are a forum that brings their all functions within the organization, to process a wide range of knowledge. The aim of this forum is to solving problems and generating company innovation. As the name implies, communities of practice oriented, to exchange best experience practices (best practices) that has been done by employees. Therefore, active participation of members determines the quality of communities of practice.

Communities of practice have been well researched and promoted as models of both intra and inter-organizational knowledge sharing and creation. Communities of practice are promoted as a valuable approach for organizational learning in multiple environments and organizational settings. With the rise of online learning, and the necessity of building community as a valuable part of the learning process, virtual communities of practice have increasingly varied [2].

According to that description, knowledge sharing within organization can do properly when communities of practice well establish. It is because, the communities of practice, directly proportional with awareness, trust, desire all of members to share their knowledge (both in tacit or explicit) in forum discussion. Knowledge sharing in communities of practice has many methodologies, frameworks, and models that have been developed also.

Some of that are virtual communities of practices model to support faculty efforts [3]. Hybrid trust based recommender system for online communities of practice [4], and many more. All of that model will be formulated based on COWCLUS cluster approach [38]. This paper divided into five sections. Section one is introduction, section two will briefly explain about issues, methodologies, frameworks, and models that have been developed conformed to the existing

research. Section three will formulated the results from section two, based on COWCLUS cluster approach [38], so that can answer aim of section one. Section four is results and evaluation, and section five is conclusion of this paper.

## II. STUDY OF LITERATURES

In discovering an effective knowledge sharing within organization, correlated with established communities of practice, as the focus topic of discussion, there are many issues, methodologies, frameworks, and models that have been developed and researched. The authors make description and investigation of the problem based on the literatures as follows.

Model for virtual communities of practice (VCP) to support faculty efforts to adopt research based instructional strategies. The VCP was built on published recommendations for successful faculty development program. (VCP) [3]. Hybrid trust based recommender system for online communities of practice, proposed to mitigate above learning issues in online communities of practices. A case study was conducted using stack overflow data to test the recommender system [4].

Divide and conquer approach for multi social network communities of practice proposed to analyze multiplex social network by using ontology alignment method. The idea is to formalize the multiple social networks [5].

Professional forums in the United States Army compared with hybrid communities of practice in the civilian sector. Civilian and military organizations are increasingly integrating online and physical communities of practice with their knowledge management strategies to create and share knowledge, innovate, and train organizations member [6].

Knowledge portal model to support communities of practice proposed to assist the exchange of knowledge, thus it promotes the learning process [7]. Thanks to ICT, the importance of virtual communities of practice is rapidly increasing so that the usage of virtual communities of practice also growing. Virtual communities of practice can exist either inside or outside an organization, but its attribute will be different based on the perceived location of virtual communities of practice [8].

Villa communities of practice proposed to teaching engineering and engaging with the community mediated through an online portal. This project incorporates the latest research on inverted classrooms and best practices for online learning in an effort. [9]. Meta model based knowledge sharing system for disaster management, is presents architecture suitable for distributed knowledge sharing settings. [10].

SEIDET Smart Community Centre Model is correlated with communities of practice also. This model followed a descriptive analysis of ICT related work spanning, and benefits of this smart community center model, is to sharing of scarce ICT resources [11]. Agile methods for large organizations in building communities of practice explain that workshop practices that amass people from different parts of organizations, to perform a specific well defined task, can be used effectively to solve issues that span over multiple teams and to build up communities of practice [12].

Inter organizational community of practice for Information security, discuss about ongoing research which tries to adopt a community of practice, a widely used knowledge management tool, to improve the security knowledge level of InfoSec practitioners. IS027001 has been adopted to refine the roles of people and process under the paradigm of InfoSec [13]. The application of a community of practice, supported by an portal,

to share knowledge in order to improve the offshore development practices of a global engineering company [14].

A virtual learning environment (blackboard v5.0) was used to facilitate constructivist and collaborative learning experiences such as problem-based learning, situated in the practice context in communities of students [15]. Community of practice mediated by internet describes how internet can support these communities (philanthropy) and illustrates this point of view with the presentation of a real case, running for two years in Canada. [16].

Learning process model called CAPK (context, actor, pipe and knowledge object), proposed to describe learning happened in a Web 2.0 to enhanced community of practice. Then a solution for sharing practice knowledge among community of practice, beyond the various boundaries is proposed by sharing context information generated in the interaction between actor and knowledge object [17].

Forming a communities of practice in a distributed learning environment (DLE), examines how the tutors started to form a communities of practice in the first year of operation. The distance from the main campus made communication difficult for the tutors, lectures, students, and use of information with communication technologies (ICT) added to challenges [18].

Digital documents in organizational communities of practice also developed, to get an effective knowledge sharing mechanism [19]. System for identifying a key element of emerging fields, in field community of practice, consisting of active scientists and researchers proposed. The system, not only simply count these human actors and the interactions between them, but also examines other non-human actors with which they interact, such as organizations, publications and terminologies [20].

Online communities of practice are promising to integrate formal and informal learning by provide systematic online resources and open communication chances among physically distributed participants [21]. The goal of Tele-learning exchange is to scaffold the next generation of collaborative researchers and surrounding a web repository tool to build a community of practice [22].

E-Catalunya is the platform promoted by the Government of Catalonia for virtual communities of practice. Using collaborative tools, the participants produce collective knowledge and stimulate change towards a more efficient organization [23]. The goal-oriented modeling framework is a model of digital social media ecosystems include agents causing changes over a time and detect disturbances coming from outside [24].

The use of communities of practice is one of the practices that agile practitioner literature suggests for knowledge sharing and coordination in large agile software development [25]. The System-Oriented UAV simulator SOUL used for software agents that monitor formation of teams. Operators must be working in communities of practice [26].

E-Learning based training particularly by using Web 2.0 can improve not only competences of SME staff, but also the processes of knowledge development within companies and across them [27]. The use and design of communities of practice, proposed as a tool to support knowledge sharing within MOOC (massive open online courses) and identify key factors for effective learning [28].

The conceptual framework of a semantic group formation model, of IT communities of practice formation proposed. The intended model aims for effective formation of group in organization for community of practice in InfoTech, a

purposeful selected for the research [29]. Framework for community of practice based on SECI method and knowledge management cycle proposed to ensure that the knowledge management processes [30].

In order to realize specific goals on informal learning, knowledge management and professional identity reform and development, more and more people, groups and organizations are looking to develop Internet-mediated communities of practice (IMCoP) [31]. Knowledge sharing portal model, development in community of practice among doctors, used to conduct studies in the literature on previous research and preliminary survey in several hospitals [32].

Twitter (web 2.0) is used to sharing knowledge entrepreneurship in the NASF community of practice. NASF and its member's identity change participating in twitter and face to face meetings while adapting to the new communicative, economic and social circumstances [33]. The concept of online communities of practices, using Web 2.0-enabled applications has been very successful within a social context [34].

User-generated FAQ collections are a common aspect of the internet culture that integrates knowledge of particular practices, thus playing the role of technology-based conceptual artifacts [35]. Modeling trust and reputation within communities of practice describe a theoretical framework for the organization of communities of practice in a dynamic perspective. The inter-organizational behavior of communities of practice members has been researched and formalized using agent-based representation [36]. The potential use of virtual communities of practice to help the development of knowledge sharing of practice, and knowledge management proposed [37].

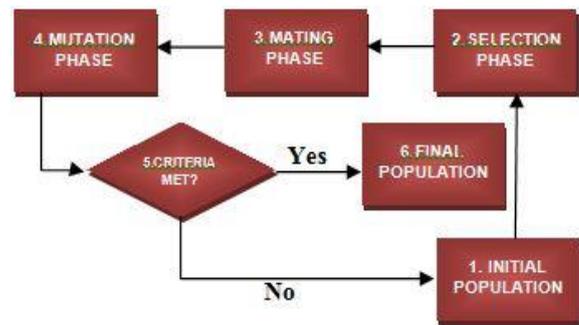
Based on the study of literatures, to discover an effective knowledge sharing in organization, that became the topic of discussion, description and investigation of the issues problem, raised an interesting question for further discussion, namely:

- Are there similarities, differences, things that can be criticized, as well as being integrated into a new idea (open research problems and models) based on the study of literatures that have been done?

- Which issues, methodologies, frameworks, and models that make a significant contribution, to discover an effective knowledge sharing in organization? So that becomes an answer for research question. Author examined further in next section with COWCLUS cluster approach [38].

### III. FORMULATION WITH COWCLUS CLUSTER

According to the study of literatures in previous section (section two), we can make agglutination of the issues, methodologies, frameworks, models that have been developed conformed to the existing research. Theirs can be used to discovering an effective knowledge sharing in organization with find a new model or issues, so that can answer research problem based on COWCLUS approach. There is a flowchart based on COWCLUS cluster approach [38] that used to formulated several literatures in section two.



**Figure1. Flowchart of COWCLUS Approach [38].**

#### Note of Figure1:

- 1.Initial Population: Searching population from several literatures correlated with research topic.
- 2.Selection Phase: Collect the selected literatures.
- 3.Mating Phase: Make a short explanation of literatures.
- 4.Mutation Phase: Formulate the literatures.
- 5.Criteria Met: Check result from literatures that formulated, and grouping them (if not match, recheck).
- 6.Final Population: Results from literatures that formulated successfully.

According to the literatures that already formulated with the COWCLUS approach, there are several models that appear. This models which is can be grouping and be an agglutination for answer a research question in section one, to discover an effective knowledge sharing in organization, that become a problem topic of the research.

#### A. Virtual/ Online Based Model.

Models that widely use to enhance knowledge sharing by communities of practices are via virtual/online model mechanism. The models are divided into several domains, such as virtual communities of practice for engineering pedagogy, proved to be cost effective and time efficient for the faculty participants [3]. Virtual communities of practice are a good source for sharing and acquiring knowledge because of its power as collective knowledge [8]. Community of practice mediated by internet describes how internet can effectively support these communities (philanthropy). Online communities of practice are promising to integrate formal and informal learning by provide systematic online resources and open communication chances [21]. Goal-oriented modeling framework is a model of digital social media ecosystems for effective communities of practices [24]. Internet mediated communities of practice is develop to realize specific goals on informal learning, knowledge management and professional identity reform and development [31]. Virtual communities of practice to help development of knowledge sharing of practice, and knowledge management proposed [37].

#### B. Ontology Based Model.

Ontology based model can use to enhance communities of practice also. Ontology alignment function is employed to discover the best mapping condition between personal ontologies, to divide and conquer approach for multi social network communities of practice [5]. Conceptual framework of an ontology semantic group formation model, of IT communities of practice formation proposed to get an effective formation of group in organization for community of practice in InfoTech [29].

### C. Portal Based Model.

Portal model has similar mechanism with virtual/online based model that use to enhance knowledge sharing by communities of practices. The key difference between portal and virtual/online model is on their system based. When portal model has specific system that especially develop to accommodate communities of practice itself, but in virtual/online model only use specific system in activity of communities of practice. Portal model divided into several domain also such as, knowledge portal model to support communities of practice proposed to assist the exchange of knowledge, thus it promotes the learning process [7]. Villa communities of practice proposed to teaching engineering and engaging with the community mediated through an online portal [9]. Application of a community of practice, supported by an portal, to share knowledge in order to improve the offshore development practices of a global engineering company [14]. Virtual learning environment (blackboard v5.0 portal) was used to facilitate constructivist and collaborative learning experiences [15]. Tele-Learning portal based surrounding a web repository tool to build a community of practice [22]. Application e-Catalunya is the platform promoted by the Government of Catalonia for virtual communities of practice [23]. Knowledge sharing portal model, development in doctor's community of practice to explains factors that influence effectiveness of sharing knowledge among physicians [32].

### D. Agile Based Model.

Agile methods for large organizations in building communities of practice to perform specific well defined task, can be used effectively to solve issues that span over multiple teams and to suggests for knowledge sharing and coordination in large-scale agile software development [12] [25].

### E. Web 2.0 Based Model.

Learning process model called CAPK proposed to describe learning happened in a Web 2.0 to enhanced community of practice [17]. E-Learning based training particularly by using Web 2.0 can improve not only competences of SME staff, but also the processes of knowledge development within companies and across them [27]. Twitter (web 2.0) is used to sharing knowledge entrepreneurship in the NASF community of practice [33]. The concept of, online communities of practices, using Web 2.0-enabled applications has been very successful within a social context [34].

### F. Hybrid Based Model.

Hybrid trust based recommender system for online communities of practice, proposed to mitigate above learning issues in online communities of practices [4]. Professional forums in the United States Army compared with hybrid communities of practice in the civilian sector, whereas Army professional forum have always been similar to hybrid communities of practice, they are distinguished by the culture of the profession [6].

### G. ICT Based Model.

Descriptive analysis of ICT related work spanning, and benefits of this SEIDET model, is to sharing of scarce ICT resources [11]. Forming a communities of practice in a distributed learning environment (DLE), examines how the

tutors started to form a communities of practice in the first year of operation use of information with communication technologies (ICT) added to challenges [18].

### H. Other Based Model.

Meta model based knowledge sharing system for disaster management proposed [10]. Inter organizational community of practice for Information security, discuss about ongoing research which tries to adopt a community of practice, to improve security knowledge level of InfoSec [13]. Digital documents in organizational communities of practice also developed, to get an effective knowledge sharing mechanism [19]. System for identifying a key element of emerging fields, in field community of practice, consisting of active scientists and researchers proposed [20]. System-Oriented UAV simulator SOUL used for software agents that monitor formation of teams. Operators must be working in communities of practice [26]. The use and design of communities of practice, proposed as a tool to support knowledge sharing within MOOC (massive open online courses) and identify key factors for effective learning [28]. Framework for community of practice based on SECI method and knowledge management cycle proposed to ensure that the knowledge management processes [30]. User-generated FAQ collections are a common aspect of the internet culture that integrates knowledge of particular practices, thus playing the role of technology-based conceptual artifacts [35]. The inter-organizational behavior of communities of practice members has been researched and formalized using agent-based representation [36].

According to the agglutination, we can make a taxonomy table /map of issues, methodologies, frameworks, and models that have been developed, researched and formulated with COWCLUS cluster approach, to discover an effective knowledge sharing in organization.

## IV. RESULT AND EVALUATION

At this section, explain the result and evaluation of the study, based on the formulation in previous section (section three). The aim is to answer the research question in section one, which are issues, methodologies, frameworks, and models, that makes a significant contribution for discover an effective knowledge sharing in organization. The result and evaluation are divided into a several point.

- a. Models that appear, in case that commonly used for the activities of the communities of practice, are virtual/online communities of practice.
- b. Model for enhance personal condition and formation group in communities of practice, is ontology based.
- c. Model that use for forming and accommodate communities of practice itself is portal based.
- d. Agile method in building communities of practice is to solve issues that span over multiple teams and to suggest for knowledge sharing with coordination.
- e. Models that use to enhance competence member and process in communities of practice are Web 2.0 based.
- f. Model to mitigate above learning issues in online communities of practices, is hybrid trust based recommender system online communities of practice.
- g. Model that use for forming a communities of practice in a distributed learning environment is ICT based.

Other models appear also. The models are for disaster management is meta-model knowledge sharing based. Improve the security knowledge level with inter organizational communities of practice based. Digital documents based are

used for enhance knowledge sharing mechanism. The massive open online courses, is a tool used for knowledge sharing. The SECI model is to ensure knowledge management process.

## V. CONCLUSION

According to COWCLUS approach results on previous section, now we know there are several models with the specific purposes to make an effective knowledge sharing in organization based on communities of practices (correlated with research question on section one). Such as models that cover activities, enhance competence, forming, building, and mitigate in communities of practice, in purposes to maintain the knowledge sharing can be do properly and iteratively. The future research opportunities, that appears from this study is to develop significance model to comparing, calculate, and counting, every model that become a results and evaluation, so that can be applied in specific organization.

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