

A Systematic Methodology for Defining the Minimal CoP for Effective Organizational Knowledge Management

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Abstract

In building CoP in an organization, it is imperative that all the mission critical operations must be covered. The enterprise analysis comprising all business processes and data classes in the form of CRUD matrix is used as the foundation for constructing CoPs and the associated interfaces between CoPs. The Mapping of CoPs onto the collaborative tools enables the recording of tacit information supporting the critical mission of an organization. Hence, the top management now has a systematic ways to ensure the continued operations of the CoPs and assured that all the critical business functions are now taken care by CoPs.

1. Introduction

One of the main aims of KM is to provide an environment for optimal sharing of knowledge between individuals and groups by articulation and by socialization []. It becomes well accepted that CoPs becoming the repository of knowledge in an organization. With a modern collaboration support system, it is feasible for networks of people coming together to share and to learn from one another face-to-face and virtually. These communities of practice are held together by a common goal and purpose that is supported by a desire to share experiences insights, and best practice, especially, the moving of tacit knowledge to some form of explicit articulation recorded in a collaborative system. An individual can always transform own tacit knowledge in a way that can be stored or formalized. This process of making tacit knowledge explicit allows it to be shared within the CoP.

The topic of Community-of-Practice (CoP) has been discussed in the management literature since the earlier part of 1990's, and has attracted a lot of attention from academics and professionals. However, there are a small number of studies, which

explain what makes a community to engage in a discussion to share their knowledge and experience. Hafeez and Alghata [1] discusses how knowledge transfer takes place in a virtual community of practice. The discourse analysis conducted in this study illustrates that participation of domain experts play a crucial role to conduct a vibrant and meaningful debate. In the area of identifying CoP, there is a limited work published. The method for building CoP based on ontology of KM services is considered in [5]. In [6], the authors present a method based on analysis of the relationships between instances of a given ontology in order to identify potential CoPs in an organization. The design of situated ontologies for knowledge sharing in a CoP is studied [7]; The issue of typology of virtual CoPs (i.e. CoPs interacting through ICT) is addressed by [8]. This ontology aims both at modeling the members of the CoP and at annotating the CoP's knowledge resources.

The assumption that knowledge is inseparable from the communities that create it, use it, and transform it, motivates the use of Community of Practice(CoP) concept in KM. A CoP is a group of people sharing a common area of expertise and/or who search for solutions to common problems. A CoP is thus not necessarily an authorized or identified group. People in a community of practice can perform the same job, collaborate on a shared task or work together on a product. What holds them together is a common sense of purpose and a real need to know what each other knows. Most organizations will hold several communities of practice and most people belong to at least one of them. In supporting the community, some form of KM mapping must be performed as that explicit knowledge in the organization is methodically stored, categorized, and shared. However, in the past, the cost of formalizing knowledge is very high and the resulting solution is not always very useful. The rate of and the probability of its reuse determine the benefit of

formalizing a 'piece' of knowledge. Moreover, the recording of individual tacit and group tacit knowledge is not well supported. In Section 2, a systematic approach in forming CoPs and the associated structured information is proposed. It is shown that this approach produces the CoPs that cover all the mission critical business of the organization. Consequently, the CoPs will be effective instrument in maintaining competitive advantage of an organization. In Section 3, a method for identifying interfaces between is proposed to identify the number of Cops that must handle the business processes and knowledge between related Cops.

2. The Identification of CoPs

CoP foundational elements consists of the domain of the practice which is the knowledge area that brings a community together and gives it an identity, the Community comprising the practitioner group for whom the domain is relevant including the the practitioners that are interested in the interface between CoPs, and finally, the mechanic by which the knowledge, methods, tools, stories, cases, and documents can be deposited and open for discussions.

In an organization, the most important asset is the structured information stored in various information systems since these are the processes and data that support the most mission critical operations of the

organization. The non structured information including the tacit knowledge are complementary to enable the enhancement and optimization of the operation.

In identifying the CoPs, first, the enterprise functionalities will be modeled as a CRUD matrix [] in which all the business processes and data classes are all accounted for. The entries of the matrix with two dimensions composed of the business process and data class are "c" representation the process creating the data of the corresponding data class. Or, the entry is u, which means that the corresponding process consumes the data in the corresponding data class. Finally, the entry with a blank "" represents that fact that the business process has nothing to do with any data in that data class. The example of the crud matrix shown in Figure 1. Then, by performing affinity analysis, on rows and columns of the CRUD matrix, it is then possible to form groups of business processes and corresponding data classes that contain only the "c" entries in each of the groups. These groups are mutually exclusive but the union of these groups would cover all the business processes and data classes. So, a CoP will be defined as the set of business processes and corresponding data classes derived from the procedure described. For example, there are 7 Cops derived from the affinity analysis shown in Figure 2. The 7 CoPs are: Strategies, R&D, Financial Planning, Procurement Contract, Human Resource, Support, and IT.

Process	Data Classes														
	Planning	Policy/Regulation/Legal	Man Power	Mission and Function	Personnel	Products	Financial Status	Procurement and Contracts	Work in Progress	Training	Security and Safety	Reference Information	Agency Agreements	Fixed Assets and Expenses	ADP Information
Implement Policy Guidance from OCE	C	U	U	C		U		C	U		U	C	C	C	
Manage Research and Development Programs	U	U	U	U	U	C	U	U	C	U	U	U	U	U	U
Manage Reimbursable and Small Problem Program	U	U	U	U	U	C	U	U	C	U	U	U	U	U	U
Provide Strategic Direction	U	U		C				U				U	C		
Develop Improved O&M Procedures		U				C	U	C							
manage Financial Resources	U	U	U				C	U	U				U	U	
Manage Procurement and Contract	U		U				U	C	U			U		U	U
Manage Manpower	U	U	C	U	C		U	U	U	C	U		U	U	U
Manage Organizational Effectiveness Programs	U	U	C		U	U	U		U	C				U	
Manage Public Affairs Program	U	U	U	U	U	U			U			C	U	U	U
Manage Personnel Training	U	U	U	U	U		U	U		C	U	U			U
Develop Improved Planning, Design & Construction Procedures		U				C	U	C							
Manage Laboratory Support Functions	U	U	U	U		U	U		U		U	C	U	C	U
Provide Staff Review and Approval	U	U	U	U	C	U	U	U	U	U	U	U	U	U	
Investigate and Solve Personnel Problems		U			C	U	U		U	U	U				
Manage Safety and Security Activities		U			U					U	C				U
Formulative Army RDT&E Programs	C	C	U	U	U	U	U		U	U	U	U	U	U	U
Manage Automation and Information	U	U				U	U	U	U	U	U			U	C

Figure 1. CRUD matrix containing all business processes and data classes of an enterprise.

3. Interfacing CoPs

The community form in each CoP would be the people who operate or use the information systems and structured data defining the CoPs. In this manner, the management has a systematic ways of identifying the CoPs that are most effective in supporting the business functions of the organization.

A CoP encapsulates operational knowledge, explicit and tacit operated by the stakeholders of the business processes and data classes. However, CoP would not be stand alone in reality. CoP needs to interface with

other CoPs. However, only the CoPs that are relevant with respect to a given CoP should be of concern. From The CoPs as shown in Figure 2, the interfaces between CoPs can be derived by examining the usage (u) and creation (c) of data pattern as defined in the CRUD matrix. Figure 3 shows the interfaces of the 7 CoPs from Figure 2. Hence, it can be seen that the in addition to the usual stakeholders, there must be members of CoPs that are interested in the interface of CoPs. These are the members that need to reside in the CoPs with connected links.

Process	Data Classes															
	Policy/Requirement, Law, Reg.	Mission and Function	Agency Agreements	Priority	Work in Progress	Products	Financial Status	Procurement and Contracts	Man Power	Training	Personnel	Security and Safety	Reference Information	Fixed Assets and Expenses		ADP Information
Implement Policy Guidance from OCE	C															Strategies CoP
Provide Strategic Direction	C															
Formulate Army RDT&E Programs	C															
	C															R&D CoP
	C															
manage Financial Resources	U															Financial Planning CoP
Manage Procurement and Contract	U															
	U															Procurement & Contact CoP
	U															
	U															Human Resource CoP
	U															
Manage Safety and Security Activities	U															Support CoP
Manage Public Affairs Program	U															
Manage Laboratory Support Functions	U															IT CoP
	U															

Figure 2. Forming of CoPs from CRUD Matrix.

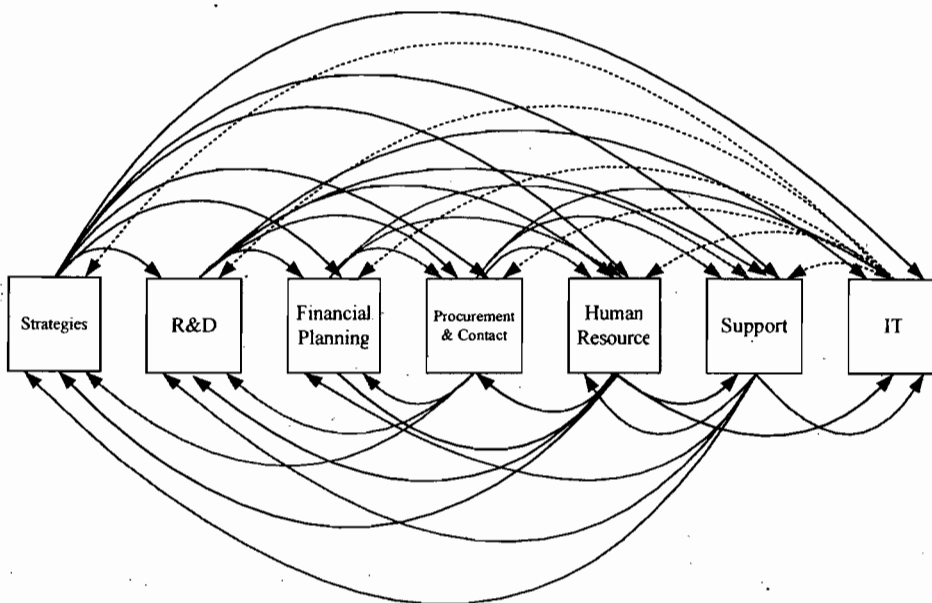


Figure 3. Interface of CoPs

4. Conclusion

In setting up CoPs that would have system-wide impact on the performance of an organization, it is imperative that CoPs be set up to cover all the business areas.

We have proposed the use of enterprise analysis based on CRUD matrix and affinity analysis to derive the set of CoPs that cover all the business critical mission functions of an organization so that the stakeholders of each CoPs would be able to associate the roles and the value that will be created as a community to improve the operational performance of the business processes own by the community. Moreover, we have also identify the need to form the common members that would handle the interface of knowledge and operations between two CoPs. In this manner, the management is ensured that the most critical operations of an organization will be taken care of by the CoPs.

5. References

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