Chapter 1

Assessing the Community Maturity from a Knowledge Management Perspective

Knowledge is considered as a strategic resource in the current economic age. Strategies, practices and tools for enhancing knowledge sharing and knowledge management (KM) in general have become a key issue for organizations. Despite the demonstrated role of communities in sharing, capturing and creating knowledge, the literature is still missing standards for assessing their maturity. Even if several knowledge-oriented maturity models are provided at the enterprise level, few are focusing on communities as a mechanism for organizations to manage knowledge. This chapter proposes a new Community Maturity Model (CoMM) that was developed during a series of focus group meetings with professional KM experts. This CoMM assesses members' participation and collaboration, and the KM capacity of any community. The practitioners were involved in all stages of the maturity model's development in order to maximize the resulting model's relevance and applicability. The model was piloted and subsequently applied within a chief knowledge officers' (CKO) professional association, as a community. This chapter discusses the development and application of the initial version of CoMM and the associated method to apply it.

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1.1. Introduction

Knowledge is considered as a key competitive advantage [PEN 59], therefore several knowledge-intensive organizations are investing in methods, techniques and technologies, to enhance their KM, among others through communities. The community-based KM approach has become one of the most effective instruments to manage organizational knowledge [BRO 91]. Indeed, Wenger [WEN 98] argues that knowledge could be shared, organized and created within and among the communities. He posits that communities of practice (CoPs) are the company's most versatile and dynamic knowledge resource. They form the basis of an organization's ability to know and learn. From practical and theoretical perspectives, we can find several types of communities (of practice (CoPs), virtual CoP (VCoP), of interest (CoIN), of project, etc.). Furthermore, since they mostly deal with knowledge, Correa *et al.* [COR 01] call them knowledge communities (KCs) and consider them as a key KM resource through socialization [NON 95, EAR 01].

Nowadays, due to the increasing use of communities in the professional context and the exponential growth of social networks and online communities [RHE 93], it is more important than ever for modern organizations to assess the quality of their outcomes, and to understand their role in intra- and interorganizational KM settings. To establish such an understanding, many questions need to be answered, including but not limited to: how do we determine the type of a community? Under which conditions are communities more productive and useful for organizations? How they can be beneficial to KM: knowledge sharing, capturing and co-creation? Which attitudes and capabilities should individuals develop to better involve themselves within communities? What kind of facilitation means do they need for operating better? Are there different levels of quality that can be recognized and that communities should aim for? Which role should knowledge and collaboration technologies play to foster productivity? How can we measure the impacts of communities on organizational performance? Therefore, it is clear today that organizations urgently need guidance on those issues and on how to take advantage from the KCs' production and to efficiently use and manage them for better sharing, learning and innovating.

Several scholars have proposed models and approaches to assess communities [VER 06, MCD 02]. One way to assess the overall characteristics, management, evolution and performance of a community is

through a maturity model approach with a KM-oriented perspective. Maturity models have been used extensively in quality assurance for product development [FRA 02].

Few efforts have been reported on using maturity models to assess communities, especially from a KM perspective. Most of the KM models proposed in the literature (such as Global Knowledge Management Maturity Model (GKMMM [PEE 06]), Knowledge Management Assessment Project (KMAP [GAL 08]), Model for General Knowledge Management within the Enterprise (MGKME [GRU 08]) and Knowledge Navigator Model (KNM [HIS 09])) are either very generic at the enterprise organizational level and/or not enough specific to assess communities. Very few community-oriented KM maturity models have been proposed [GON 01, LEE 10]. Even if these examples of models present an interesting theoretical perspective, little is reported on their application and evaluation. They are not specifically KM oriented and most of them focus only on CoPs. This chapter is an attempt to address this gap and to propose a new model for assessing communities from a KM perspective sufficiently generic to be applied to any community or social network. It addresses the following research question:

How do we determine the maturity level of a community from a KM perspective?

This question can be divided in two subquestions:

– What characteristics describe a community's maturity?

– What steps need to be taken to measure a community's maturity in terms of KM?

This chapter advances a CoMM that was developed in cooperation with a focus group consisting of professional KM experts. The CoMM is intended to be usable by practitioners for conducting self-assessments. This chapter first discusses the development of the initial version of the CoMM and the associated method to apply it, and second an application and evaluation that provide evidence of proof of value and proof of use in the field. The purpose of this chapter is to further serve as a starting point for future research in this area.

The remainder of this chapter is structured as follows. We first present the theoretical background related to maturity models. Next, we introduce

our research approach to develop the CoMM, based on the design science perspective. Then, we report on the field application of the CoMM within a CKO professional association. Lastly, we present the implications for research and practice, followed by our conclusion that summarizes the limitations of this ongoing research and presents future research directions.

1.2. Background

The word maturity is equivalent to *"ripeness",* which means having reached the most advanced stage in a process. Maturity is a quality or state of becoming mature [AND 03]. Paulk *et al.* [PAU 93, p. 21] define process maturity as "the extent to which a specific process is explicitly defined, managed, measured, controlled, and effective". They describe the transition from an initial to a more advanced state, possibly through a number of intermediate states [FRA 02]. Maturity models position all the features of an activity on a scale of performance under the fundamental assumption of ensuring plausible correlation between performance scale and maturity levels. A higher level of maturity will lead to a higher performance [FRA 03]. "At the lowest level, the performance of an activity may be rather *ad hoc* or depend on the initiative of an individual, so that the outcome is unlikely to be predictable or reproducible. As the level increases, activities are performed more systematically and are well defined and managed. At the highest level, 'best practices' are adopted where appropriate and are subject to a continuous improvement process" [FRA 03, p. 1500].

1.2.1. *Maturity models*

Approaches to determine process or capability maturity are increasingly applied to various aspects of product development, both as an assessment instrument and as part of an improvement framework [DOO 01]. Most maturity models define an organization's typical behavior for several key processes or activities at various levels of "maturity" [FRA 03]. Maturity models provide an instantaneous snapshot of a situation and a framework for defining and prioritizing improvement measures. The following are the key strengths of maturity models:

– They are simple to use and often require simple quantitative analysis.

– They can be applied from both functional and cross-functional perspectives.

– They provide opportunities for consensus and team building around a common language and a shared understanding and perception.

– They can be performed by external auditors or through self-assessment.

One of the earliest maturity models is Crosby's Quality Management Maturity Grid (QMMG) [CRO 79], which was developed to evaluate the status and evolution of a firm's approach to quality management. Subsequently, other maturity models have been proposed for a range of activities including quality assurance [CRO 79], software development [PAU 93], supplier relationships [MAC 94], innovation [CHI 96], product design [FRA 02], R&D effectiveness [MCG 96], product reliability [SAN 00] and KM [HSI 09]. One of the best-known maturity models is the Capability Maturity Model (CMM) for software engineering (based on the Process Maturity Framework of Watts Humphrey [PAU 93], and developed at the Software Engineering Institute (SEI)). Unlike the other maturity models, CMM is a more extensive framework in which each maturity level contains a number of key process areas (KPAs) containing common features and key practices to achieve stated goals. A number of studies of the software CMM have shown links between maturity and software quality (e.g. [HAR 00]). This model (with multiple variations) is widely used in the software industry.

Nowadays, several maturity models have been proposed that aim at clearly identifying the organizational competences associated with the best practices [FRA 02]. In practice, however, many maturity models are intended to be used as part of an improvement process, and not primarily as absolute measures of performance [FRA 02]. Few maturity models have been validated in the way of performance assessment. An exception is Dooley *et al.*'s study [DOO 91] that demonstrated a positive correlation between new product development (NPD) process maturity and outcome.

1.2.2. *Knowledge-oriented maturity models*

The interest in KM dates back to the early 1990s when companies realized the strategic value of knowledge as a competitive resource and a factor of stability for their survival [SPE 96]. There is more than one definition of KM. Mentzas [MEN 04, p. 116] defines KM as the "discipline of enabling individuals, teams and entire organizations to collectively and systematically create, share and apply knowledge, to better achieve the

business objectives". KM generally refers to how organizations create, retain and share knowledge [ARG 99, HUB 91]. It involves the panoply of procedures and techniques used to get the most from an organization's tacit and codified know and know-how [TEE 00]. According to McDermott [MCD 02], "tacit knowledge is the real gold in knowledge management and CoPs are the key to unlocking this hidden treasure". Wenger [WEN 98] defines CoP as a group of people who share a concern, a set of problems or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. It is distinguished by three essential characteristics: a joint enterprise, a mutual commitment and shared repository/capital [WEN 02]. On the one hand and in the broadest sense, Correa *et al.* [COR 01] consider any community as a KC where members share knowledge (tacit or explicit) around an interest, a practice or a project activity. On the other hand, Cummings [CUM 03] posits that knowledge sharing is the means by which an organization obtains access to its own and other organizations' knowledge. In the case of these communities, Bresman *et al.* [BRE 99] argued that individuals will only participate willingly in knowledge sharing once they share a sense of identity (or belonging) with others. This sense of identity is one of the several key factors to reach maturity for a community.

In the context of this research, we define *community maturity as a community's maximum capability to manage knowledge where community members actively interact/participate and effectively collaborate, reach mutual commitment based on a well-shared capital and adjust their efforts and behaviors in fulfilling the community mission by producing high-quality outcomes.*

Recently, a number of maturity models related to KM have been proposed: the GKMMM [PEE 06] is descriptive and normative. It describes the important characteristics of an organization's KM maturity level and offers Key Process Areas that characterize the ideal types of behavior that would be expected in an organization implementing KM. The KMAP [GAL 08] is based on the qualitative GKMMM [PEE 06] and Q-Assess developed by Science Applications International Corporation (SAIC). Q-Assess represented 12 subassessments to assess levels of maturity across three KPAs: people, processes and technology. This model allows assessing workgroups, and it highlights weaknesses and gives recommendations to deal with them. The MGKME [GRU 08] is composed of two levels: the underlying level and the operating level. Under each

category, many key issues are focused upon and addressed in the assessment process. They consist of managerial guiding principles, *ad hoc* infrastructures, generic KM processes, organizational learning processes, and methods and supporting tools. The KNM [HSI 09] is developed in order to navigate the KM implementation journey. This maturity model consists of two frameworks, namely: evaluation framework and calculation framework. The first one addresses three management targets: culture, KM process and information technology. The second one is characterized by a four-step algorithm model.

Each of the above maturity models deals with KM evaluation within organization; thus, it correlates maturity levels only with KM evolution stages and do not deal with many characteristics of communities: common values, sense of identity, history, etc. These models are not intended to assess communities in an informal mode in intra- or inter-organizational setting, even less in a holistic manner from a KM perspective. They address, more specifically, a formal project mode context in intra-organizational setting. Many of these models are descriptive and normative (e.g. GKMMM and MGKME), they do not prescribe or present actions to perform in order to address weaknesses revealed by the model.

Very few maturity models related to communities have been proposed. First, the community evolution model proposes five main stages as community maturity levels, which are potential, building, engaged, active and adaptive [GON 01]. For each of these stages, they defined fundamental functions and used three perspectives in order to describe the characteristics of every maturity stage. These perspectives are the behavior of people, degree and type of process support, and types of technology encountered at each stage. Second, the maturity model presents four stages of maturity (building, growth, adaptive and close) [LEE 10]. This model gives a snapshot of the current community maturity level based on a set of critical success factors, analyzes the stage and proposes a guide for improving the CoP. These maturity models are not all knowledge-oriented *per se*. Most are inspired from the five-staged CMM model without trying to focus on the originality of communities and to develop a maturity model that fit exactly with them. These models aim to assess communities in an intra-organizational context under a set of characteristics related to maturity stages. Furthermore, based on these models, we cannot differentiate a community from a social network or even a project team. Moreover, these models may not be generalized on different types of community since they focused mainly on CoPs.

Name	GKMMM	KMAP	MGKME	KNM	CEM	MM	CoMM
Reference	[PEE 06]	[GAL 08]	[GRU 08]	[HSI 09]	[GON 01]	[LEE 10]	Current research
Results focus	Descriptive	Prescriptive	Descriptive	Descriptive	Descriptive	Prescriptive	Prescriptive
Goal	Intra-organizational KM assessment	Intra-organizational KM assessment	Intra-organizational KM assessment	Intra-organizational KM assessment	Intra-organizational CoP assessment	Intra-organizational CoP assessment	Intra- and cross-organizational community assessment
	Enterprise	Enterprise	Enterprise	Enterprise	CoP	CoP	Any community
Work mode	Formal project mode	Formal project mode	Formal project mode	Formal project mode	Informal community mode	Informal community mode	Formal project mode and informal community mode
Assessment focus	KM evolution stages (inspired from CMM)	KM evolution stages (inspired from CMM and based on GKMMM)	Underlying and operating levels (derived from the Nonaka and Takeuchi's SECI model [NON 95])	Evaluation and calculation frameworks (inspired from CMM and other KM maturity models)	Community Evolution stages (community lifecycle)	Community Evolution stages (community lifecycle) basing on a set of critical success factors	Holistically (fitting with communities' characteristics and stages)

Table 1.1. *Comparison of CoMM with other maturity models*

The main objective of the study reported in this chapter is to present the blueprint for a new CoMM based on the literature, which addresses some of the limitations described earlier. This prescriptive model is sufficiently generic to be applied to all types of communities and networks. It aims to assess the KM maturity of a given community holistically. Further, it supports the development of recommendations to improve the quality of outcomes and therefore the performance.

1.3. Method

The present research is based on a design science, an inductive approach. Design science research tries to meet the identified business needs through the building and evaluation of artifacts [HEV 04]. These artifacts are built to address unsolved problems, and are evaluated with respect to the utility they provide in solving these problems. This approach is very suitable for the development and application/evaluation of the CoMM by demonstrating its practical feasibility and utility through pilot and field studies according to Hevner *et al.*'s [HEV 04, p. 86] design evaluation framework.

Constructs, models, methods and instantiations are the four design artifacts produced by design science research in information systems (IS) [MAR 95]. In our research, the CoMM artifacts would be represented as follows:

– *Constructs*: the CoMM structure that describes the community characteristics (areas of concerns or topics) and their related criteria.

– *Model*: the CoMM questionnaire that includes questions, levels of rating and mathematical equations for analysis.

– *Method*: the CoMM method that (1) defines the steps and provides guidance on how to run the CoMM questionnaire in the field and (2) supports the development of recommendations.

– *Instantiation*: the CoMM tool that is a customized MS Excel application that represents the implementation of the above artifacts and enables the execution of a concrete assessment.

The development and application of the CoMM can be summarized as follows. First, based on the literature, we identified the main previous research in the area of maturity models in general and the knowledge-oriented ones in particular. Second, to maximize the proposed maturity model's relevance and practical applicability, KM experts were involved from the early stages (see section 1.4.1) in the development of CoMM artifacts (focus group meetings, see section 1.4.2) and the implementation in the field (pilot studies, see section 1.4.1). Third, the model was field tested within a CKO professional association to evaluate its artifacts on the ground (see section 1.5). Further field studies should be continued to enhance the quality of the CoMM artifacts (structure, questionnaire, method and tool) still under validation.

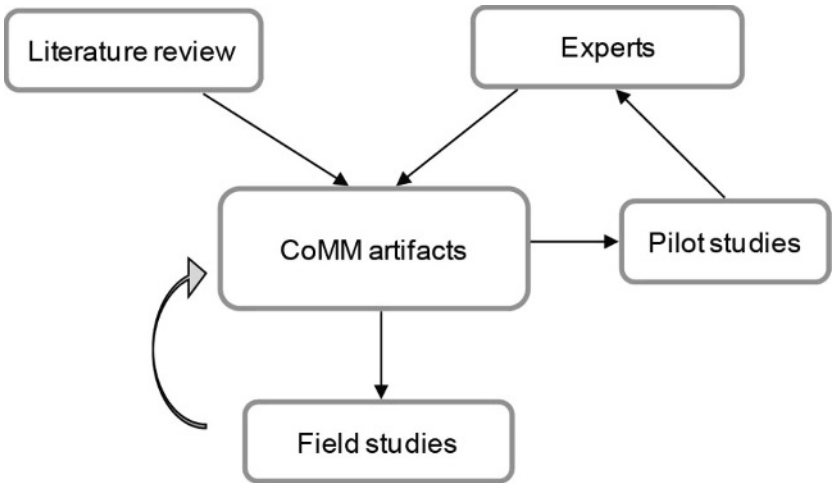

Figure 1.1. *CoMM development and application steps*

1.4. The CoMM

1.4.1. *The development*

The CoMM was developed in cooperation with a focus group consisting of professional KM experts. These experts were accustomed to meeting in the context of a professional association (1) to share their best practices regarding methods, techniques and tools, (2) to get their peers' feedback on case studies and (3) to attend special presentations on the latest trends in the KM area. The involvement of the experts' group enabled us, in the words of Hevner *et al.*'s research framework [HEV 04, p. 80], "to combine relevance and rigor by meeting a business need with applicable knowledge" and so to maximize the resulting artifacts' relevance and applicability. In the following, we report on the focus group meetings on the CoMM development between January 2007 and March 2008. The goals of these meetings were threefold. First, to build a generic CoMM for the holistic assessment of a community based on previous maturity models. Second, to apply the model in practice through pilot and field studies. Finally, to provide guidelines and a tool to enable practitioners for conducting self-assessments with the model.

1.4.1.1. *Participants*

The focus group experts included 12 CKOs working for different companies of different sizes (ranging from 1,000–5,000 to 100,000–200,000 employees, including seven multinational firms) in different sectors (including automotive, software, audiovisual, civil engineering and telecommunications). The participants held at least a Master's degree (MSc or MBA; two held a PhD) from different areas (including industrial design, mechanical engineering, human resources, management, computer science and ergonomics). They had at least 10–15 years of work experience, with 58% of them having 5–9 years as a CKO. The average age of the CKOs was 44 years; 75% were male. Table 1.3 provides more details on participants.

1.4.1.2. *Focus group process*

The development of the CoMM took more than 1 year. The focus group process consisted of 3-h-long monthly meetings. Seven meetings were used to work on the CoMM artifacts, three meetings for participants' feedback on pilot studies and three hosted external presentations related to maturity models and community-based KM approach from professional and research perspectives. The focus group meetings were facilitated by a researcher. The participants expressed the following critical requirements for the CoMM:

– *Resource efficient*: the CoMM should be quick to complete.

– *Rich data*: the CoMM should report on different points of view and concerns from the workplace, using both quantitative and qualitative data.

– *Limited need for further advanced data analysis*: the supporting tool should provide integrated support for the interpretation of the results.

– *Self-assessment*: practitioners should be able to apply the CoMM themselves.

– *Constructive learning*: the CoMM should promote community consolidation and organizational learning rather than control.

The main seven working meetings as the focus group process steps can be summarized as follows:

– The *first step* consisted of the generation of the antecedents to KM within communities. Following this meeting, two thematic presentations were planned on the topic.

– The *second step* was to generate the requirements, analysis levels and topics of analysis for a useful CoMM. One presentation was provided after this meeting on a literature review of KM maturity models.

– The goal of the *third step* was to generate during the meeting the constructs of the CoMM in terms of criteria and levels of assessment.

– The *fourth step* focused on the development of the CoMM questionnaire in terms of items (questions), rating levels, average calculations and weightings.

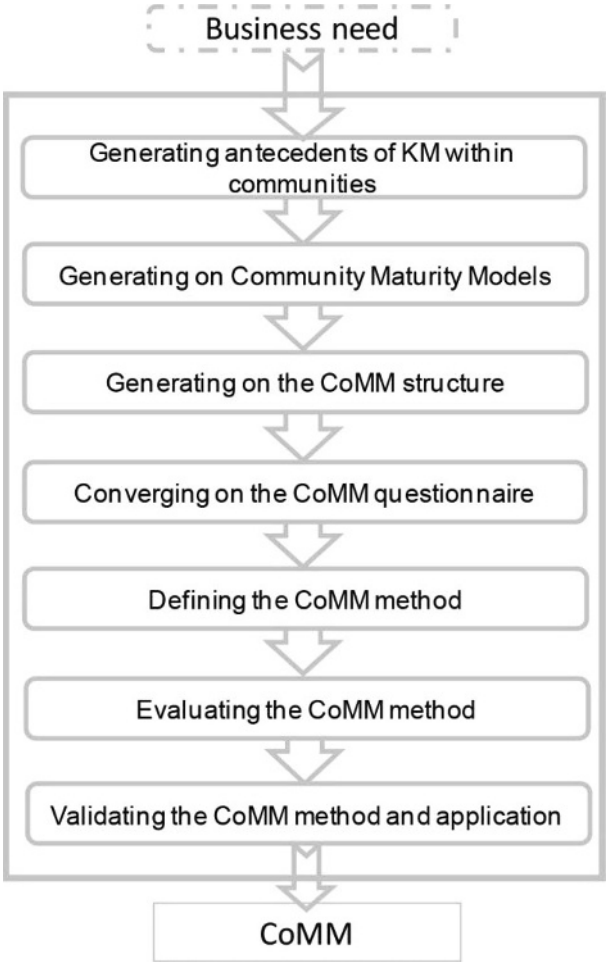

Figure 1.2. *Focus group process and steps*

– The *fifth step* addressed the CoMM method in terms of project scope, respondents' selection and questionnaire running in practice. Following this meeting, the CoMM was tested in two pilot studies (i.e. for a sound engineering community and a sustainable development community) that were organized in the companies of two of the participants (i.e. the audiovisual CKO and the aeronautic CKO, respectively). As a result, two feedback presentations and group discussions were planned.

– In the *sixth step*, the use of the CoMM method was evaluated. Several adjustments and improvements were proposed and discussed in this meeting. After that, the CoMM tool was designed (by a third party) and another pilot study (for a change management community) was presented by the IT consulting CKO.

– In the *final step*, both the CoMM method and tool were approved by the focus group in the presence of the executive president of the association who was interested in applying the CoMM within the association (see section 1.5).

1.4.2. *The description*

The CoMM aims to assess the maturity of a given community holistically from a KM perspective. It supports the development of recommendations in the form of an action plan to reach improved quality and performance. Its applicability is not limited to a particular type of community (of practice, of interest, virtual, etc.) but to any KC. The model can be used for different organizational settings (intra- or inter-organizational).

1.4.2.1. *Structure*

Inspired by the maturity model literature, CoMM distinguishes between four maturity levels: *ad hoc*, exploring, managing and optimizing. At the *ad hoc level*, the community is emerging (but not yet as such) and therefore immature to effectively manage knowledge (emergence or forming stage). Members have many difficulties in interacting/participating and effectively collaborating, reaching mutual commitment based on a shared capital and adjusting their efforts and behaviors in fulfilling the community's mission by producing high-quality outcomes. At the *exploring level*, the community is at the structuring stage and members are well aware of their weaknesses in terms of maturity to manage knowledge. Members try to build mutual commitment based on a shared capital, but are faced with many challenges. Some initiatives to address these are attempted but without major impacts.

At the *managing level*, the maturity of the community is quite good (maturation or performing stage), but there still is room for improvement. In general, members have quite a good sense of community and are able to produce good-quality outcomes. At the *optimizing level*, the community is mature enough to manage (and even to create) knowledge and very well structured (consolidation or norming stage). Members perform/operate together optimally and are able to accomplish high-quality outcomes.

Unlike the other maturity models discussed earlier, CoMM explores the maturity of a given community holistically from a KM perspective related to its basic characteristics. The following areas of concerns (inspired mostly from [WEN 98]) were considered essential by the participants in the focus group meetings to analyze the maturity of a community:

– *Joint enterprise (action):* all that makes a community an autonomous entity: practices, missions/objectives, interests, production, etc.

– *Mutual commitment:* mutual aid relationship among members that is necessary for knowledge sharing [CRA 01]. It is also the realization of actions to maintain coherence, which is necessary within a KC.

– *Shared capital:* it is the whole informational capital created, retained and shared by the community, which allows its members to create new knowledge starting through interaction, participation and collaboration.

– *Collaborative work:* collaborative tasks/activities and processes carried out by members within the community with the goal of sharing and creating knowledge (experiments, know-how, best practices, etc.). It is also methods and technologies that support them [BOU 12].

For each area of concern, a number of criteria were defined (see Table 1.2). These criteria represent the topics for a questionnaire (CoMM questionnaire). Each criterion is represented by an item that is evaluated on a four-level scale. To support the respondents, the levels of each criterion are described briefly, with examples wherever possible.

Respondents are allowed to provide scores such as “0.5”, “1.5”, “2.5” and “3.5”. When a respondent cannot answer, no score is recorded. The calculation of points provides the level of maturity (*ad hoc* (<20%), exploring (20–50%), managing (50–80%) and optimizing (80%–100%)).

Areas of concern	Criteria	References
Joint enterprise	1. Legitimacy	[DOW 75]
	2. Mission	[DRE 87]
	3. Common areas of interest	[WEN 98]
	4. Knowledge creation/construction	[NON 94]
	5. Management endorsement	[KAY 02, MUN 07]
Mutual commitment	6. Admission of members	–
	7. Code of conduct	[PAI 94]
	8. Motivation	[OST 00]
	9. Level of participation	[DRI 78]
	10. Mutual trust	[BAI 86]
Shared capital	11. History	–
	12. Common repository	[BER 94]
	13. Information capital	[ATK 93]
	14. Common values	[MAS 92]
	15. Sense of identity	[GRE 58, BRE 99]
Collaborative work	16. Communication	[SHA 48, KHA 06]
	17. Animation, facilitation and coordination	[CLA 93, MAL 94]
	18. Cooperation and collaboration	[SCH 94, BRI 03, BOU 07]
	19. Knowledge and collaboration technologies	[JOH 91, GRI 03, GRE 08]

Table 1.2. *CoMM structure*

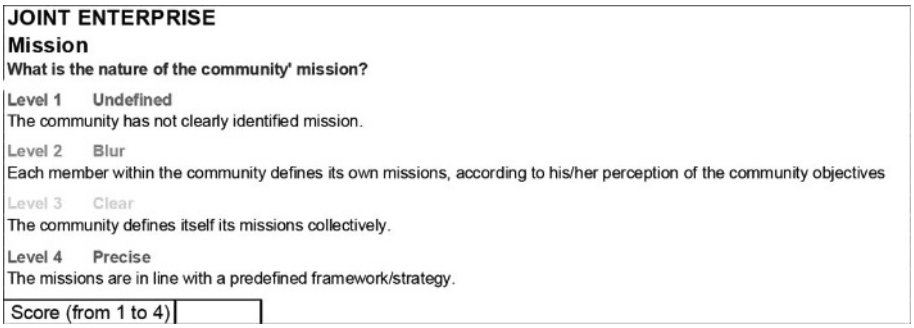

Figure 1.3. *Example of criterion in CoMM (captured from the CoMM tool)*

In essence, the CoMM is structured as a library of criteria. Sometimes, not all criteria are relevant. So, the evaluators can decide which criteria fit better with a particular context. They can also decide to expand the set of criteria. Also, for some contexts, certain criteria may be more important than others. In such situations, it is possible to assign different weights to the criteria.

1.4.2.2. *Process*

The CoMM method defines the steps to perform the analysis. Figure 1.4 shows the seven main steps in the method.

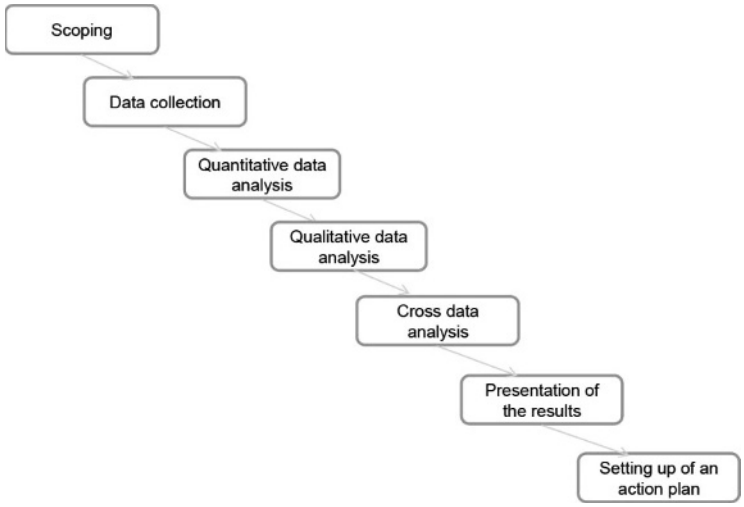

Figure 1.4. *The seven steps in the CoMM method*

At the scoping step, the purpose of the CoMM analysis is defined according to the organizational context and business needs and strategy. The boundaries of the analysis are precisely defined before starting. The reasons for performing the assessment should be communicated to all the community members. It is important to present this as a holistic community assessment to improve the overall performance, rather than as an individual evaluation of members.

The data collection is performed through individual and/or collective interviews based on the CoMM questionnaire (quantitative data). The selection of members should be representative of the target community according to their roles (leader, coordinator, expert, contributor/active member, etc.). During interviews, qualitative observations should be collected to enrich the analysis and gain a deeper understanding of any perception differences that may exist. After the data collection, a first quantitative data analysis is performed using the CoMM tool (see below). This analysis presents individual perceptions about the knowledge-oriented maturity of the community. It also helps us to identify critical perception differences concerning the different criteria. The qualitative data analysis (that could be done with a content analysis method based on statements collected during interviews) helps us to get a more in-depth understanding of these perception differences for each criterion or group of criteria (area of concern or topic). Follow-up discussions and consensus building efforts could be carried out for relevant scores, in order to settle on an acceptable assessment. The cross-analysis may yield additional interpretations by combining criteria for specific measurements of capabilities according to the aim of the assessment, such as knowledge sharing (criteria 8, 9, 12 and 13), social capital (criteria 6, 7, 10, 11, 12, 13, 14 and 15), value creation (criteria 4, 9 and 18) and organizational learning (criteria 12, 13, 17, 18 and 19).

The results can be presented through the CoMM: (1) individual spider diagrams of all criteria scores individually or grouped by topic. (2) Superposition of individual spider diagrams showing the rating gaps on individual criteria or topics. (3) Comparison curves, which allow visualizing perception differences between different respondents regarding the same criterion. This helps us to identify criteria for which it is necessary to collect additional information. (4) Collective spider diagrams of all criteria scores individually or grouped by topic. These represent the collective perception of the maturity of the community. (5) Cloud matrices showing the combination of criteria.

The last step of the CoMM method concerns the definition of an action plan. It helps in the framing of concrete recommendations in terms of actions to improve the community performance and quality of outcomes. Such actions may involve a variety of initiatives, for example the clarification of the community missions, strengthening of the sense of community/identity, developing a charter/code of good conduct, training on virtual facilitation techniques and providing the appropriate collaboration technologies.

1.4.2.3. *The CoMM tool*

CoMM Excel application was customized to allow data collection quantitatively and qualitatively during the interviews and to analyze the quantitative data automatically. It provides different presentations of results and the results' report generation (spiders, curves, etc.).

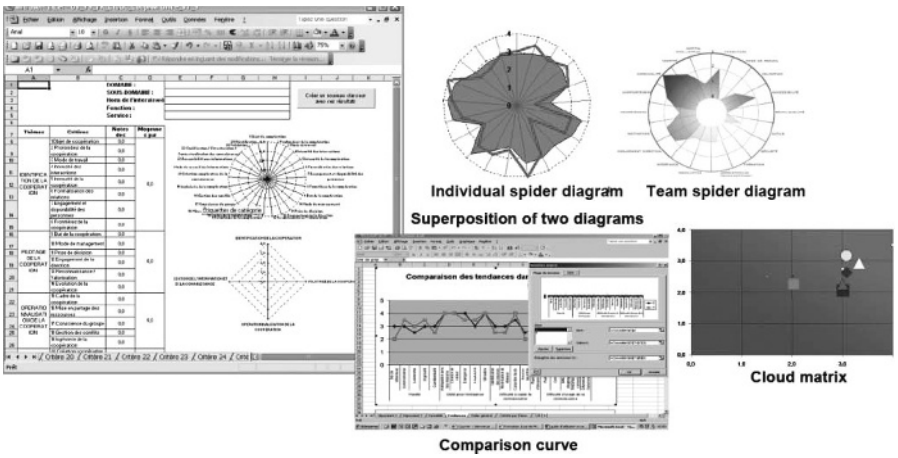

Figure 1.5. *The CoMM tool data collection and analysis*

1.5. Application within a CKO professional association

1.5.1. *Overview of need*

As we mentioned earlier, the CoMM was developed in cooperation with KM experts from a French KM association. This non-profit industrial association of CKOs was founded more than 10 years ago. Its objectives are:

– to develop an activity of cross-sector dialogue and debates between decision makers, practitioners and experts around the KM field;

– to help the managers to locate their action compared to the major evolutions in this strategic field;

– to propose think tanks, meetings (face-to-face and virtual), documents, best practices, etc., allowing to collect rich and global information in a very short time;

– to increase the dialogue between stakeholders and extend networks;

– to provide the members with an operational tool kit and guidelines helping them to implement steps of KM in their organizations.

This association functions by thematic workgroups, which work on topics identified as crucial for KM: economic aspects, change management, human resource and competence management, business intelligence, collaboration, innovation, communities and social networks, etc. Each workgroup, led and facilitated by a chair, produces deliverables that are integrated into the association knowledge capital to be shared by all the members through an Intranet platform (shared space), reports, multimedia CD-ROMs, trainings, etc. Particular and specific events allow gathering all the members for more informal exchanges.

The association is considered first, by players and environment, as a CoP in the KM field since all the developed topics are in the KM field, and second as a KC since its main objective is to share and produce knowledge among members. The CoMM is one of its future deliverables. It is developed in the framework of the communities and social networks workgroup. The executive president of the association was interested to apply the CoMM within the association itself, as a field evaluation, among all members and workgroups to assess whether the association is an efficient KC or not, able to help members and organizations to share knowledge (e.g. best practices), and to see how to improve the association management and quality of outcomes.

1.5.2. *Field application steps*

The field application followed the CoMM method steps. As presented to members, the objectives of the CoMM analysis were to check:

– if the association had all the required characteristics to be qualified as a KC;

– if the association had adequate capabilities and means to effectively support high-quality KM actions, at least good knowledge sharing;

– if the operation and management (animation) of the association are well made;

– if members are interacting well, participating and collaborating;

– if they have a real shared capital;

– if collaboration technologies provided were well selected and effectively used.

All members of the association, 58 persons in total (39 CKOs, 11 CKO surrogates and 8 KM consultants) from different organizations, were asked to participate to this field application. The CoMM questionnaire was sent to the respondents before the meeting with an introduction to the CoMM objectives. Anonymity and confidentiality of the treatment of the responses were formally assured to ensure the authenticity of the opinions. Sixteen individual interviews and six collective interviews (seven persons each) were conducted face-to-face in French. Next, two collective interviews were conducted to examine perception gaps on some criteria. Each interview lasted approximately 90 min.

During the interviews, the CoMM tool was used for data collection. All interviews were recorded for further qualitative data analysis if needed. After the quantitative (through CoMM Excel application), qualitative (on some specific statements) and cross-data (mainly on knowledge sharing capabilities) analyses, a first report was sent to the respondents to solicit any corrections before the final report was prepared. A final presentation to the association board was scheduled in February 2009 to report on the results and provide recommendations in form of a list of suggested future actions. The final report was posted to all the members.

1.5.3. *Findings*

The findings were reported as a discussion of the different perceptions related to the CoMM criteria and topics. Findings reported to the association members according to the four CoMM areas of concern include:

– *Joint enterprise:* we found similar perceptions about legitimacy of the community, its mission, common areas of interest among members and different perceptions regarding knowledge creation. Indeed, the members' seniority positively impacts their perception of this criterion.

– *Mutual commitment*: we noted different perceptions between new members and old members regarding admission of members. A few years ago this relied on co-optation; today, rather, it relies on a simple statement. There is almost a consensus on mutual trust that governs the association, only some exceptions related to the consultant profile.

– *Shared capital:* we found different perceptions on common repository. Even if sharing is one of the most important key elements of the KC, members do not care to share information and knowledge optimally. However, they have the same understanding of concepts and believe in the existence of valuable information capital held by the association.

– *Collaborative work:* we noted different perceptions among members on the community animation and the degree of use of collaboration technologies from workgroup to another. This depends on the generation to which each one belongs. The older generation is more familiar with face-to-face meetings which are expensive and difficult to organize. Facilitation skills in face-to-face situations are different from virtual situations.

Through the qualitative data analysis (in this case, limited to a quick reviewing of respondents' statements), we found some concerns among members about the involvement of consultants in the association. They are sometimes perceived as "lurkers" or opportunists, i.e. people who take much more than they give/share. Turnover among the members is quite common. However, a core has already been formed a few years previously. For some, association activities are more beneficial for former members. In what is shared, we can find different types of information and knowledge. Some are very interesting and others not at all. Knowledge sharing can be further improved and optimized.

The general findings reported can be summarized as follows:

– The KM association is a real KC, which is very useful for sharing best practices between members and organizations. Many means are proposed for this: monthly face-to-face workgroup meetings, meeting minutes, a shared intranet platform based on a content management system (CMS),

workgroup-based organization and deliverables, publications (three books and two CD-ROMs), internal and external training, annual seminar, etc.

– From the outside, this association seems closed off especially to small and medium enterprises (SMEs). Membership fees are high.

– The association is mature enough to share knowledge (best practices, guidelines, tools, etc.). Sharing rules and levels are not sufficiently formalized.

– The maturity level of this association was between the exploring level (42 points) and the managing level. The association has reached the structuring stage.

– Knowledge sharing was considered good enough from the internal viewpoint to the association and less good from the outside viewpoint.

– The involvement of researchers is very appreciated by practitioners.

In the final report, various recommendations were proposed, including:

– Giving a new name to the association for highlighting the openness of its structure (e.g. network or community) and offering three levels of participation: for everyone interested by the KM field as a community/network (third level) and for members who pay their membership fees as a club (second level) with a hard core of board and active members (first level).

– Creating a scientific committee for the association bringing together some VIPs (from the world of academia and business), giving it a better image and evaluating its progress and outcomes.

– Clarifying and better balancing the responsibilities of everyone (board members, facilitators, active members) in the functioning of the association.

– Assessing the performance and outcomes of each workgroup annually.

– Using more Web 2.0 technologies to enhance interaction, participation and knowledge sharing among people within and outside the association, e.g. by using wikis, blogs, RSS, social networks, etc.

– Expanding the activities of the association to become a reference in the KM field and a place of socialization for all players: referencing books, white papers, curriculums, services and providers, funding, tools, surveys, etc.; making the bridge between research and business and facilitating partnerships; participating in scientific events such as conferences; and

publishing results such as case studies with the assistance of researchers both in French and English.

After 1 year, three of the suggested recommendations were followed up with concrete actions:

– The third recommendation was clearly mentioned in the priorities of the executive board. Tasks and responsibilities were assigned to each board member, and the role of the facilitator was more clarified and formalized. A scale of confidentiality has been created based on access rights and the level of participation of members.

– Following the fourth recommendation, a new system of workgroup assessment was introduced to annually check the outcomes of each workgroup.

– Following the fifth recommendation, a blog for the association was created and a KMpedia project was launched (a specific online Wikipedia for the KM field).

– Following the sixth recommendation, the association with other academic partners has created a new scientific conference on KM.

1.5.4. *Reflection on the field application of CoMM*

During the application of the CoMM among this field study, we gathered various experiences and feedback regarding the appropriateness and usefulness of CoMM. According to the respondents, the CoMM analysis was interesting and correctly represented their perceptions. It focused on real issues and allowed traditionally "unspoken issues" to surface. They were also satisfied with the feedback provided to the executive board and the subsequent actions that were taken related to the assessment's recommendations. According to the workgroup facilitators, the results were relevant.

According to the board members, the study was satisfactory in terms of results and recommendations, as they confirmed and reinforced some of their own perceptions. This allowed them, for example, to focus more on the functioning of the association and participation of members.

We also received feedback and recommendations from the respondents on the CoMM questionnaire such as the possibility to review some criteria

and questions. The respondents stated that some criteria were a little bit difficult to understand. Also, the nuances between levels of responses were sometimes subjective or difficult to distinguish. In addition, they proposed to add some criteria, such as practice diversity related to the generational diversity, and to rename some areas of concern, such as "in-house collaboration" instead of "collaborative work". Finally, they suggested putting a stronger focus on collaboration and social media rather than on knowledge and collaboration technologies. Interestingly, this was complementary to the suggestions expressed by the focus group. However, since the CoMM is developed as a library of criteria, the review of the CoMM structure according to a specific context is possible; therefore, the respondents' suggestions can be easily accommodated. In terms of execution, most respondents (since anonymity and confidentiality were not a big deal in this case) expressed that they preferred the use of collective rather than individual interviews as this would enable a faster application of the CoMM process.

1.6. Discussion and implications

In this chapter, we followed the seven guidelines for design science evaluation as proposed by Hevner *et al.* [HEV 04]. To produce new artifacts (CoMM structure, questionnaire, method and tool) to be added as applicable knowledge to the knowledge base (see IS research framework in [HEV 04, p. 80], we developed a purposeful method and application (*Guideline 1: Design as an artifact*) showing, step by step, how to solve a specific problem related to the holistic assessment of the knowledge-oriented maturity of a community. This problem meets a clear business need as expressed by professionals as a means to reach better productivity and performance of communities (*Guideline 2: Problem relevance*). A total of three pilot case studies in three communities within companies and one field application within a CKO professional association using observational methods were executed to evaluate the appropriateness and usefulness of the CoMM, with the active contribution from a focus group of experts (*Guideline 3: Design evaluation*). Our literature review showed that a CoMM does not appear to be well addressed in the field, while concerned experts confirmed a clear business need (*Guideline 4: Research contributions*). The development was rigorously defined (*Guideline 5: Research rigor*) using a combination of research methods including a literature review, an expert focus group, and empirical studies (*Guideline 6: Design as a search process*). Finally, the

results of our study are and will be communicated in two steps (*Guideline 7: Communication of research*): first, the method and initial experiences are presented through publications to other researchers who, we hope, will consolidate and extend the CoMM method and application, and to practitioners who could apply the method and provide feedback and recommendations for its future enhancement. Second, after further study of the method and its application in various contexts (other field studies), top managers could decide to use it as a strategic instrument to improve their communities' performance.

1.7. Conclusion

This research tries to achieve an important business objective aimed at knowledge-intensive organizations, by providing them an instrument for assessing their communities' maturity in this direction. The literature provides some KM maturity models, but most of them are dedicated to the enterprise organizational level. In this chapter, we report on the development and a field application of a new CoMM. It was developed in an inductive perspective to meet a real business need as expressed by 12 CKOs and other experts who are regularly confronted with community performance and innovation challenges. Our contribution is both theoretical and practical as we propose a model, an application method, a supporting tool and empirical evidence of their evaluation. The results should be of interest to academic researchers and information systems practitioners interested in the management and performance of communities and/or social networks. Nevertheless, there are limitations related to this work in order to complete the design science evaluation framework. First, our empirical evidence is based on three pilot studies but only a single field application reported here in addition to three others executed by a third party in different sectors (banking, consulting and education alumni). Furthermore, field studies have to be executed to expand the evaluation of the CoMM artifacts and to further enhance the CoMM. Particular care will have to be taken to ensure that CoMM can take into account all characteristics of a given community in different settings and stages. Second, at this stage, the CoMM cannot yet be used to investigate a correlation between community maturity levels and organizational performance. However, it provides a first step in this direction. We recommend several directions for future research to enhance the current version of CoMM. First, the model has to be applied in an intra- and interorganizational context for different types of community. The

experiences from these applications will assist in the further development and evaluation of the CoMM artifacts (structure, questionnaire, method and tool). Second, the weighting of criteria, not detailed in this chapter, should be further explored and correlated with the four levels of maturity. Third, organizational and community performance measures have to be developed to enable an analysis of the relationship between community maturity and organizational productivity.

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1.9. Appendix

Sector	Firm size	Firm type	Person	Nationality	Age	Gender	Background	Level	Years of work experience	Years of work as CKO
Automotive	100,000–200,000	Multinational	P1	FR	45–49	M	Industrial design	MSc	20–24	0–4
Automotive	10,000–20,000	Multinational	P2	FR	50–54	M	Mechanical engineering	MSc	25–29	5–9
Software edition	1,000–5,000	National	P1	FR	35–39	M	Ergonomics	PhD	10–14	0–4
Audiovisual and communications	1,000–5,000	National	P1	FR	55–59	F	Human resources	MBA	30–34	10–14
Civil engineering	5,000–10,000	Multinational	P1	FR	50–54	M	Cognitive sciences	MSc	25–29	5–9
IS/IT consulting	1,000 – 5,000	Multinational	P1	FR	40–44	M	IT	MSc	15–19	0–4

Table 1.3. *Expert focus group characteristics*