

Chapter 2

Communities of Practice

Abstract This chapter reviews the literature on community of practice. Although the relevance of this form of aggregation in information systems (IS) research and organizational literature is just emerging, communities of practice have always and still do exist everywhere in every aspect of human and work life, both inside and outside organizational boundaries. After defining the concept of community of practice and reviewing its different forms, this chapter looks inside the community in order to understand certain clearly identified characteristics, such as the domain, the community and the practice. Finally, it also explores knowledge management in communities of practice by highlighting the processes of creating and sharing knowledge, and by introducing those of knowledge preservation.

Keywords Community of practice • Types of community of practice • Knowledge management processes • Knowledge creation and sharing • Knowledge preservation

2.1 Defining Community of Practice

What is a community of practice? Defining community of practice (CoP) is not an easy task. Many academics and practitioners have addressed this issue, defining the concept in different ways. Although the term has been coined in recent years, the phenomenon is not new but refers to an age-old idea. According to Jean Lave, a cognitive anthropologist, and Etienne Wenger, an educational theorist and computer scientist, CoPs have existed for as long as people have been learning and sharing their experiences through storytelling. Some examples are the first knowledge-based social structures, back when humans lived in caves; the corporations in ancient Rome; artisans in the Middle Ages; physicians and nurses, or priests and nuns, in the late Middle Ages and afterwards; communities related to organizations and industries, whether formally recognized or not, in more recent times; etc. More generally, as Lave and Wenger (1991) assumed, communities of

practice have always and still do exist everywhere in every aspect of human life.¹ “We all belong to a number of them—at work, at school, at home, in our hobbies. Some have a name, some don’t. Some we recognize, some remain largely invisible. We are core members of some and occasional participants in others. Whatever form our participation takes, most of us are familiar with the experience of belonging to a community of practice” (Wenger et al. 2002, p. 5).

Lave and Wenger (1991) have defined the CoP as a group of people who come together to share common interests and goals, with the aim of sharing information, developing knowledge and developing themselves both personally and professionally. Other definitions of community of practice are: “groups 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” (Wenger et al. 2002, p. 4), and “a group of people informally bound together by shared expertise and passion for a joint enterprise” (Wenger and Snyder 2000, p. 139). People join communities for several reasons, such as education, professional issues, and hobbies. Within such a community, people share their experience and tacit knowledge in free flow, improving their abilities and skills, and fostering learning. CoP members explore ideas, discuss situations and needs, and help each other solve problems, although they do not meet every day. Each person has their own experience; CoP simply allows them to share such experience with other members when they meet. Unlike teams and organizational units, CoPs are self-organizing systems whose methods of interaction, rules, issues and lifespan are determined by members, based on the intrinsic value that membership brings (Sharratt and Usoro 2003; Metallo 2007). Such communities are not constrained by time and space and therefore emerge as effective loci for engaging directly in activities, conversations, and other forms of personal participation in social life (Lave and Wenger 1991; Wenger 1998; Wenger et al. 2002). Community members develop common sets of codes and language, share norms and values, carry out critical reflection, and engage in dialog with each other at a professional level, generating an environment characterized by high levels of trust, shared behavioral norms, and mutual respect and reciprocity (Sharratt and Usoro 2003). This environment has been directly linked to knowledge creation and sharing processes. Katzy and Ma (2002) argue that both the community and community members (e.g., developers, teachers, lawyers, doctors, academics and consultants) themselves could add value to the status quo in terms of knowledge creation, knowledge sharing, and identification. Indeed, people join a community to develop knowledge and specific expertise about a particular issue, which could not be obtained otherwise (e.g., Wenger and Snyder 2000; Wenger et al. 2002; Metallo 2007).

Although Lave and Wenger (1990, 1991) are recognized as the pioneers of CoP research, the phenomenon was simultaneously investigated by Brown and

¹For more details see the seminal work of Durkheim (1893), *De La Division Du Travail Social: étude sur l'organisation des sociétés supérieures* (well-known as *The Division of Labor in Society*), who traced the history of professional groups (often communities) over time.

Duguid (1991), and even earlier by Orr (1990), by Constant (1987) and by Lave (1988) herself. Indeed, the term “community of practice” was first mentioned by Lave and Wenger (1991) in their book on situated learning, but the idea has existed since Homo sapiens evolved 50,000 years ago and the phenomenon has been investigated with reference to research on the relationship between knowledge and work practice. As we will see later, practice plays a crucial role in defining CoP and developing a view of learning as social construction. In order to trace and understand the evolution of the concept of CoP, we need to focus particularly on three major publications: Lave and Wenger (1991), Wenger (1998), and Wenger et al. (2002).

According to Lave and Wenger (1991), a CoP is defined as a group of people who come together to share common interests and goals aimed at improving their skills by working alongside more experienced members and being involved in increasingly complicated tasks. The community is a locus that enables a newcomer to learn by engaging in simple tasks, assisted by comparatively or highly experienced people (the latter being commonly known as old-timers). Initially, newcomers become acquainted with the tasks, norms, values and principles of the community and then gradually increase their participation and involvement in community life. Authors have referred to the journey from being a newcomer to becoming an expert as “legitimate peripheral learning” and the underlying model of learning as “situated learning.” Unlike the old model of learning based on a mechanistic process of cognitive transmission, the new model as proposed by Lave and Wenger (1990, 1991) tends toward the logic of constructivism, which relies on social interaction at the workplace. According to this model, learning occurs in social relationships with other learners by observation and peripheral participation in the community rather than in a classroom setting. Indeed, “Legitimate peripheral participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artefacts, and communities of knowledge and practice. A person’s intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a sociocultural practice. This social process includes, indeed it subsumes, the learning of knowledgeable skills” (Lave and Wenger 1991, p. 29). Learning is, thus, “an evolving, continuously renewed set of relations” (Lave and Wenger 1991, p. 50) or, more simply, a process of social participation where the nature of the situation impacts significantly on the process itself. However, although situated learning has been a very influential corrective to previous educational methods, the contribution of individual learning continues to be recognized, as well as the validity of educational paradigm (Cox 2005).

Then, Wenger (1998) focuses on the role of the social interactive dimension of situated learning and expands the concept of CoP. According to the author, CoP refers to three dimensions: joint enterprise (*what it is about*), mutual engagement (*how it functions*), and shared repertoire (*what capability it has produced*). Joint enterprise is a joint purpose for joint action, or perhaps the higher levels of action in the job. The term joint enterprise does not merely refer to shared goals, but a negotiated enterprise, and involves mutual accountability (Wenger 1998). More specifically, joint enterprise is defined as the process in which people are engaged

and working together toward a common goal (Li et al. 2009). Mutual engagement, on the other hand, refers to norms and social interactions built by community members and leads to the creation of shared meaning on issues or problems. According to Wenger (1998), relationships of mutual engagement bind the members of the community together into a social entity. Mutual engagement plays a crucial role in CoP, representing building blocks in the functioning of the community itself. Finally, shared repertoire concerns the common resources (routines, sensibilities, artifacts, stories, vocabulary, styles, etc.) that members use to negotiate meaning and facilitate learning within the community. In this regard, a CoP is defined as a group of people who communicate with each other (mutual engagement) and develop ways and resources (shared repertoire) for reaching a common goal (joint enterprise). Based on these three dimensions (known also as community domains), Wenger (1998) also proposes 14 indicators for detecting the presence of CoP.² Table 2.1 shows the 14 indicators identifying community of practice.

Among these indicators, only two concern joint enterprise and most are abstract. However, although Wenger's (1998) book has raised controversies about the definition of CoP, it also helps identify the central role of "practice" within community. "Any community of practice produces abstractions, tools, symbols, stories, terms, and concepts that reify something of that practice in a congealed form" (Wenger 1998, p. 59). This process, known as reification, allows us to give form to experience by perceiving it as an object. Within communities, "meaning is negotiated through a process of participation and reification" (Wenger 1998, p. 55).

Another important contribution to the CoP debate has been provided by Wenger et al. (2002), authors of the book *Cultivated Communities of Practice*. As Cox (2005) suggests, with this book Wenger marks a decisive shift in his own writing into a different discourse, moving the focus from a social perspective, in term of individuals' learning and identity development, to a managerialist conception of community. CoP is vaguely defined as "groups 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" (Wenger et al. 2002, p. 4). Although this definition is vaguer than the previous 14 indicators used to identify CoP, it does not limit communities to groups within a company. Instead, community becomes a tool for organizations, which can engineer and cultivate CoPs aiming to enhance workers' knowledge. Cultivating community means fostering existing ties to create new groupings of people who, ignoring the formal boundaries of organization, work

²Some critiques of Wenger's conceptualization of CoP have been advanced by Cox (2005), who believes the use of the term community is not appropriate to describe the emergent relationships around a practice. Based on sociological thinking, Cox (2005) states that the term community is not clearly definable and that Wenger's conceptualization is paradoxical in the history of that term. For instance, unlike Wenger, Cox (2005) argues that CoP is not necessarily friendly or harmonious (Indicator 1); a group is based on a practice not a locality (Indicator 7); a group of people who differ, having different skills and knowledge and "mutually defining identities" (Indicator 8). Further arguments are summarized in research by Roberts (2006), whose review of critiques of the CoP approach focuses more on variables of power, trust, and predispositions.

Table 2.1 The 14 indicators identifying community of practice

Wenger's indicators	CoP domains
1. Sustained mutual relationships—harmonious or conflictual	Mutual engagement
2. Shared ways of engaging in doing things together	Mutual engagement Joint enterprise
3. The rapid flow of information and propagation of innovation	Mutual engagement
4. Absence of introductory preambles, as if conversations and interactions were merely the continuation of an ongoing process	Mutual engagement Shared repertoire
5. Very quick setup of a problem to be discussed	Mutual engagement Shared repertoire
6. Substantial overlap in participants' descriptions of who belongs	Mutual engagement
7. Knowing what others know, what they can do, and how they can contribute to an enterprise	Mutual engagement Joint enterprise
8. Mutually defining identities	Mutual engagement
9. The ability to assess the appropriateness of actions and products	Shared repertoire
10. Specific tools, representations, and other artefacts	Shared repertoire
11. Local lore, shared stories, inside jokes, knowing laughter	Shared repertoire
12. Jargon and shortcuts to communication as well as the ease of producing new ones	Shared repertoire Mutual engagement
13. Certain styles recognized as displaying membership	Mutual engagement
14. A shared discourse reflecting a certain perspective on the world	Mutual engagement

Source Wenger (1998, p. 125)

together to share knowledge and creatively solve problems (Cox 2005). Thus, communities of practice provide value through their ability to improve business outcomes (short term) and to develop organizational capabilities (long term), coming out as a way to realize business strategy (Wenger et al. 2002). With respect to previous research, Wenger and colleagues also revise the CoP characteristics into “*domain* of knowledge, which defines a set of issues, *community* of people who care about this domain, and the shared *practice* that they are developing to be effective in their domain” (p. 27). Using these three constituent elements for defining CoP as a social structure, the authors also clarify “*what is not a community of practice*,” pointing out the differences from other types such as functional units, operational teams, informal networks, communities of interest, and professional associations. Distinctions between CoP and other structures are reported in Table 2.2.

Although such distinction is useful for teaching purpose, the results are too unclear and contradictory for research (see Li et al. 2009). For example, the difference between CoP and community of interest appear too vague for Fischer (2001), who distinguishes two types of communities: homogeneous (known as CoP), consisting of members from a single discipline; and heterogeneous (known as community of interest or community-of-communities), which refers to a multidisciplinary team. Communities of interest, as Fischer (2001, p. 4) suggests, “bring together stakeholders from different CoPs to solve a particular (design) problem of common concern.” In this regard, a community of interest should be regarded as a variation on a CoP rather than something else.

Table 2.2 Communities of practice and other structures

	What's the purpose?	Who belongs?	How clear are the boundaries?	What holds them together?	How long do they last?
Communities of practice	To create, expand, and exchange knowledge, and to develop individual capabilities	Self-selection based on expertise or passion for a topic	Fuzzy	Passion, commitment, and identification with the group and its expertise	Evolve and end organically (last as long as there is relevance to the topic and value and interest in learning together)
Formal departments	To deliver a product or service	Everyone who reports to the group's manager	Clear	Job requirements and common goals	Intended to be permanent (but last until the next reorganization)
Operational teams	To take care of an ongoing operation or process	Membership assigned by management	Clear	Shared responsibility for the operation	Intended to be ongoing (but last as long as the operation is needed)
Project teams	To accomplish a specified task	People who have a direct role in accomplishing the task	Clear	The project's goals and milestones	Predetermined ending (when the project has been completed)
Community of interest	To be informed	Whoever is interested	Fuzzy	Access to information and sense of like-mindedness	Evolve and end organically
Informal networks	To receive and pass on information, to know who is who	Friends and business acquaintances, friends of friends	Undefined	Mutual need and relationships	Never really start or end (exist as long as people keep in touch or remember each other)

Source Wenger et al. (2002, p. 42)

2.2 Types of Community of Practice

Communities of practice can take different forms. Knowing the variations among CoPs is important for better understanding “what it is” and “what it is not,” as well as the organizational setting. Although it is an interesting issue, few contributors have tried to investigate the typologies of CoP (e.g., McDermott 2000a, b; APQC 2001; Fischer 2001; Gongla and Rizzuto 2001; Wenger et al. 2002; Dubé et al. 2006;

Metallo 2007). In particular, the research of McDermott (2000a, b) and APQC (2001) focuses on the initial purposes that lead people to join or develop communities or organizations. Fischer's study (2001), by contrast, investigates communities according to the type undertaking similar work (or their cultural background), so distinguishing the CoP (homogeneous community) from the community-of-communities (heterogeneous community).

Gongla and Rizzuto (2001) focus on CoPs within organizational boundaries, and IBM in particular, as well as on their stages of evolution. Such communities are defined as an institutionalized knowledge network; that is, an informal network of professionals managing domains of knowledge within organizations (Gongla and Rizzuto 2001).

A more comprehensive taxonomy of communities of practice is provided by Wenger et al. (2002) and Dubé et al. (2006). In particular, it must be acknowledged that the study of Wenger et al. (2002) seems to be the first to offer a wide classification of the forms of CoP. The authors identify a different typology of communities, such as small/big, short-lived/long-lived, co-located/distributed, homogeneous/heterogeneous, inside boundaries/across boundaries, spontaneous/intentional, and unrecognized/institutionalized (Wenger et al. 2002, pp. 24–27). While the literature recognizes the initial effort to identify and categorize the various forms of community, some criticisms later emerge, related to (1) the comprehensiveness of the taxonomy and (2) the exclusion of technology as a driver for the classification.

Finally, a more recent contribution tries to overcome the limits of Wenger et al. (2002) research, so offering a more comprehensively articulated taxonomy of the forms of CoP (Dubé et al. 2006). In contrast to Wenger et al. (2002) research, the study of Dubé et al. (2006) focuses more on a specific type of CoP, i.e. virtual CoP, pointing out the crucial role of technology in today's communities.

Based on these researches, I have looked again at the forms identifying the categories and features that lead to their composition as well as the main contributions related to the theme. Table 2.3 shows the variety of forms of CoP.

Thus, to identify the various forms of CoP, we select the nine most meaningful structural features and classify them into four categories: demographic, organizational, individual and technological.

With reference to the “demographic category,” I identify the following three types of community:

1. *Young or old*: age defines the period of time the CoP has been in existence. In this regard, we can place the duration of the CoP along a continuum from young (less than a year) to old (more than five years). Some scholars (Gongla and Rizzuto 2001; Dubé et al. 2006) find a relationship between the age of a community and its level of maturity (commonly known as stage of community development). Based on previous research, Dubé et al. (2006) distinguish five stages of development: potential, coalescing, maturing, stewardship and transformation; and assume that young communities are usually in the early stages, while old communities are in later ones.

Table 2.3 Forms of community of practice

Categories	Features	Forms of community of practice	Support from literature
Demographic	Age	Young/old	Gongla and Rizzuto (2001), Dubé et al. (2006)
	Size	Small/big	Von Krogh (2002), Wenger et al. (2002), Dubé et al. (2006)
	Lifespan	Short-lived/long-lived	Wenger et al. (2002), Dubé et al. (2006)
Organizational	Creation process	Spontaneous/intentional	McDermott (2000a, b), APQC (2001), Wenger et al. (2002), Dubé et al. (2006)
	Organizational boundaries	Inside boundaries/across boundaries	APQC (2001), Gongla and Rizzuto (2001), Wenger et al. (2002)
	Degree of formalization	Unrecognized/institutionalized	APQC (2001), Gongla and Rizzuto (2001), Wenger et al. (2002)
Individual	Proximity	Co-located/distributed	Wenger et al. (2002), Dubé et al. (2006), Metallo (2007)
	Background	Homogeneous/heterogeneous	Fischer (2001), Wenger et al. (2002)
Technological	Degree of reliance on ICT	Face-to-face/virtual	Dubé et al. (2006), Metallo (2007)

2. *Small or big*: CoPs are “small” or “big” depending on the number of members involved in them. Although their size can change, it is not yet clearly distinguished in the literature. Wenger et al. (2002), indeed, assume that small communities involve only a few specialists, while big communities consist of hundreds of people. Other research links size with organizational issues in terms of active community participation, individual interest, social relationships, and contribution (e.g., Von Krogh 2002; Dubé et al. 2006). Although both communities usually comprise a core group of members who contribute actively, plus peripheral members, the size does matter. For instance, “a large community is more likely to include people with contingent, diverse, and distributed interests, and social relationships may become ephemeral” (Dubé et al. 2006, p. 78).
3. *Short-lived or long-lived*: the lifespan of a CoP varies from short-lived (temporary) to long-lived (permanent). Some communities of practice, such as artisans, boat makers, etc., exist over centuries because they are created on a permanent basis with no definite time frame in mind (Wenger et al. 2002; Dubé et al. 2006). Others, such as COBOL programmers, are assembled on a temporary basis to accomplish a specific purpose (Wenger et al. 2002;

Dubé et al. 2006). Thus, the first type can be defined as “long-lived,” while the latter are “short-lived” communities.

With reference to “organizational category,” the following three types of community are identified:

1. *Spontaneous or intentional*: Communities of practice have existed for ages, born in response to people’s spontaneous need to group, share ideas, and be helped (McDermott 1999; Wenger et al. 2002; Dubé et al. 2006). Communities of artisans, boat makers, violin makers, gangs of street cleaners, etc. are common examples of spontaneous communities. On the other hand, communities are also launched to meet the needs of organizations for specific knowledge and skill resources. These types may be intentionally established by management, who also define the community’s purpose and select key members (Dubé et al. 2006). At other times, however, communities emerge spontaneously on the initiative of their members and are then recognized and accepted by management.
2. *Inside boundaries or across boundaries*: Communities of practice often exist either entirely within organizations (inside boundaries), and in particular within a business unit or across business units, or across organizational boundaries (across boundaries) (Wenger et al. 2002). Organizations can decide to promote collaboration, social relationships and knowledge sharing by establishing CoPs that cross boundaries across work groups, organizational units and even organizations (Wenger and Snyder 2000; Dubé et al. 2006). Across-boundaries communities allow a greater number of people to join. However, a low level of boundary crossing may also facilitate interaction among community members, as well as the exchange of ideas and knowledge sharing.
3. *Unrecognized or institutionalized*: Workers may join communities that are completely formalized, less formalized or not formalized within organizations. According to Wenger et al. (2002, p. 27), with reference to the degree of institutionalized formalism, CoPs vary in their relationships to organizations, ranging from unrecognized (invisible to the organization), bootlegged (visible only to certain groups), legitimized (taken into account by the organization), supported (receiving direct resources) to institutionalized (given an official status and function in the organization). When a CoP is institutionalized within the organization, it could be considered a formal unit like other business units or divisions.

With reference to individual categories, the features related to proximity of relationships and cultural background lead us to identify two additional forms of communities: co-located/distributed and homogeneous/heterogeneous.

1. *Co-located versus distributed*: The proximity of relationships or geographic dispersion among members is a useful characteristic for distinguishing co-located as opposed to distributed CoPs. Communities are co-located when members usually meet at the same place or live nearby. Although working together requires regular interaction, co-location is not a necessity (Wenger et al.

2002). Indeed, an increasing amount of evidence shows communities whose members are not physically located in the same place, but scattered around the world. Communities of scientists, for instance, whose members work for different organizations around the world, regular meet to discuss specific research topics thanks to seminars, conferences and ad hoc meetings held at the same building. However, when communities are distributed, face-to-face meetings, and thus chances to exchange ideas and share knowledge, become more complicated and expensive for members. ICT and remote-working technologies, as we will see later, provide a valid solution for such communities.

2. *Homogeneous or heterogeneous*: Communities can be distinguished on the basis of members' cultural background (Wenger et al. 2002). Indeed, communities are often composed of people from the same discipline or function (homogeneous). Sometimes, instead, communities are composed of members with different backgrounds (heterogeneous). Other research (Dubé et al. 2006) also links cultural influence with the background of community members. According to Dubé et al. (2006), cultural influence in national, organizational and professional terms is evaluated along a continuum from homogeneous to heterogeneous. Communities are homogeneous where members have similar backgrounds because they come from the same organization, or different organizations with similar cultures, and live in a country with a strongly localized culture. On the other hand, communities are heterogeneous where members have different backgrounds because they come from various organizations and live in a country with a more open culture or with different cultures.

The last category is technological. Within this category, it is possible to distinguish face-to-face and virtual (often known as web-based) communities based on the degree of reliance on ICT. These two types of community are described below.

1. *Face-to-face community versus virtual community*: new technologies, and above all those developed for supporting remote workers, have created new ways to interact and communicate for community members who used to meet exclusively face-to-face. Older communities in which members usually carried out their practice in the same organization or city, or at least in places nearby, have begun to open up to other people around the world thanks to those technologies. ICTs have reduced the spatial (physical space) and temporal (time) distances, enabling people from anywhere and at any time to join the community and perform their practice. More recently, communities have started up on a digital basis and allow members to join, interact and communicate exclusively by using the internet and ICT. Empirical evidence shows that some communities work without ICT support (known as face-to-face communities); some exclusively use ICT (well-known as virtual or online communities); and others use these technologies, but not exclusively. How can we define such hybrid communities? Are they face-to-face or virtual communities? The literature agrees that when a community uses ICT predominantly it can be called "virtual," but otherwise "face-to-face" (e.g., Wenger et al. 2002; Dubé et al. 2006; Metallo 2007).

2.3 Looking Inside Community of Practice

Having defined the concept of CoP and reviewed its different forms, it is right to look inside the community in order to understand certain clearly identified characteristics such as the domain, the community and the practice (Wenger et al. 2002). These three fundamental elements are useful to distinguish communities of practice (as previously defined) from communities (in the broadest sense). As Wenger (2011) states, not all communities are communities of practice. Indeed, a community, in the sense of a group of people who share a concern or passion for something, is a necessary but element for constituting a CoP, but not the only one. Besides the community of people, the domain of knowledge and shared practice are crucial too. Based on the work of Wenger et al. (2002), these three elements are discussed next.

2.3.1 *Domain*

What is the domain of a CoP? In 1998, Wenger relied on three characteristics, i.e. mutual engagement, shared repertoire and joint enterprise, together known as the community domain, to identify a CoP. In this regard, he defines a CoP as a group of people who communicate with each other (mutual engagement) and develop ways and resources (shared repertoire) for reaching a common goal (joint enterprise). Later, Wenger et al. (2002) revised these three characteristics and named them “domain,” “community” and “practice.”

According to Wenger et al. (2002), a domain is the area of knowledge that brings the community together and defines a set of issues that members need to address. Within communities, the domain guides the questions, so stimulating members to present their ideas for introducing or contributing to a discussion. It also facilitates the learning process among people. In this regard, the domain creates “the common ground (i.e., the minimal competence that differentiates members from non-members) and outlines the boundaries that enable members to decide what is worth sharing and how to present their ideas” (Li et al. 2009, p. 6).

As well as defining common ground, the domain also defines a sense of common identity. As situated learning theory suggests, learning also concerns a process of understanding who we are and in which CoP we belong. When acting in a community, people develop a sense of membership and are more inclined to identify with the community itself. Within CoPs, like other groups, people feel they belong to a community and are accepted by others with whom they share the practice, so developing a sense of commitment to structure and identity in their relationships (Handley et al. 2006). As Wenger (2004) suggested, within CoPs, identity is not defined by a task, as it would be within a team, but by an area of knowledge that needs to be explored and developed.

2.3.2 *Community*

While the domain creates the common ground of a CoP, the community refers to the social structures that encourage learning through interaction and relationships among members. As Wenger et al. (2002) suggest, community is a crucial element for an effective knowledge structure. Besides knowledge sharing and practice, a community is composed of people who interact and build interpersonal relationships on issues important to their domain.

Interpersonal relationships are the foundation upon which the community evolves. A community is a place in which people help each other augment their knowledge about a specific practice. Social relationships, especially if kept up regularly, enable discussion and debate among community members on issues within a domain, fostering ideas and developing a sense of belonging and commitment. The social dimension, thus, is a necessary but not sufficient condition to build a CoP. To build a CoP, as Wenger et al. (2002) assume, the interactions among members must have some continuity. For example, people who meet sporadically to discuss a particular topic do not constitute a CoP. To build a community the interactions must be regular, so enabling members to develop a shared understanding of their domain and an approach to their practice (Wenger 1998; Wenger et al. 2002).

The role of social relationships within CoPs has also been explored by other research (Lesser and Prusak 1999). Based on social capital theory, Lesser and Prusak (1999, p. 2) assume that “Communities of Practice are valuable to organizations because they contribute to the development of social capital, which in turn is a necessary condition for knowledge creation, sharing and use.” According to Nahapiet and Ghoshal (1998), social capital is the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit.

2.3.3 *Practice*

Finally, another crucial element for constituting a CoP is the practice itself. According to Wenger et al. (2002), the practice is a set of shared repertoires of resources that include experiences, stories, tools, and ways of addressing recurring problems. Rather than a community of interest, members of a CoP are practitioners, and thus develop a shared repertoire of resources. For this reason, the practice is nothing more than the specific knowledge owned, developed and shared by members within a CoP.

Based on the concept of practice developed by Wenger, some academic scholars show that this concept draws on different intellectual backgrounds and, thus, is wider and more ambiguous than Wenger assumes (e.g., Knorr Cetina 1999). In

effect, the concept of practice is stressed by some scholars who try to trace the similarities and differences in definitions and meanings (e.g., Cook and Brown 1999; Gherardi 2000; Nicolini et al. 2003; Corradi et al. 2010). Among them, the research of Corradi et al. (2010) reviews the academic research on the concept of practice in studies of organizing, learning and knowing over the last 20 years, in order to identify the different labels and meanings. In particular, Corradi and colleagues distinguish the concept of practice in two ways: as an “empirical object” and as “a way of seeing,” and identify conceptual labels for each of them.

Practice as an empirical object refers to “the locus in which scholars study the activities of the practitioners” (Corradi et al. 2010, p. 268). This concept of practice includes three principal interpretative labels: “practice-based standpoint” (Brown and Duguid 1991), “work-based learning” or “practice-based learning” (e.g., Raelin 1997; Strati 2007), and practice as “what people do” (e.g., Whittington 1996). Following Marx work, Orr (1990) and Lave and Wenger (1990), Brown and Duguid (1991) stress the concept of practice by showing the link between practice and learning within a “situated” organizational context, such as a CoP. In this regard, practice refers to “learning-in-working,” which “best represents the fluid evolution of learning through practice” (Brown and Duguid 1991, p. 41). Other scholars, instead, have investigated the link between practice and social and collective learning arising from observation, discussion and action in different organizational contexts (e.g., Raelin 1997, 2007) and, in particular in both face-to-face and virtual communities of practice (e.g., Strati 2007; Nicolini 2007; Alvino et al. 2011). Finally, some research focuses on science as practice (e.g., Pickering 1990) and on strategy as practice (e.g., Whittington 1996), emphasizing what scientists and managers do.

Practice as “a way of seeing” a context moves toward “a more explicit acknowledgement of practice as epistemology” (Corradi et al. 2010, p. 273). In respect of practice as an “empirical object,” Corradi et al. (2010) identify four other labels with reference to practice as “a way of seeing.” These are “practice lens or practice-oriented research” (e.g., Orlikowski 2000; Østerlund and Carlile 2005), “knowing-in-practice” (e.g., Gherardi 2000; Orlikowski 2002), “practice-based perspective” (e.g., Sole and Edmondson 2002), and “practice-based approach” (e.g., Carlile 2002). The first label refers to Orlikowski’s research (2002) aimed at rethinking the concept of technology in organizations. Based on the Giddens’ Structuration Theory (1979, 1984), Orlikowski (2002) develops a new model to examine the interaction between technology and organizations, known as the duality of technology. This model assumes that technology is physically and socially constructed by people working in a social context and by the different meanings they attach to it, so allowing us to see it as a social practice enacted by human action and institutionalized in structure. Similarly, Østerlund and Carlile (2005) focus on practice-oriented research to explain knowledge sharing within a CoP. Practice is not only what people do within a specific context, but is also the locus for production and reproduction of social relations. Within CoPs, indeed, knowledge resides in both practices and social relations. Knowing-in-practice is a

concept developed by Gherardi in 2000, based on the idea that knowledge is not something in people's heads, but is constructed by practicing in a context of interaction. Practice in a context is a way to enable people to acquire knowledge (Gherardi 2000; Orlikowski 2000; Nicolini et al. 2003). Practice-based perspective, instead, is a lens able to highlight the "knowledge grounded in site-specific work practice" (Sole and Edmondson 2002). Based on this perspective, practice is defined as "doing and involves awareness and application of both explicit (language, tools, concepts, roles, procedures) and tacit (rules of thumb, embodied capabilities, shared worldviews) elements. Central to the practice perspective is acknowledgement of the social, historical and structural contexts in which actions take place" (Sole and Edmondson 2002, p. 18). In this regard, practice-based perspective provides additional insights on forms (tacit and explicit) and dimensions (individual and collective) of knowledge developed into a context in which practice is performed (Sole and Edmondson 2002; Swan et al. 2002). Finally, the practice-based approach focuses on how people construct their competence in practice (Carlile 1997, 2002). According to this approach, knowledge is structured in practice and in "objects" (artifacts that individuals work with) and "ends" (outcomes that demonstrate success in creating, measuring, or manipulating objects) that are of consequence in a given practice (Carlile 2002, p. 446).

2.4 Managing Knowledge in Community of Practice

Knowledge is a strategic asset widely recognized by managerial literature, and organizational literature in particular, as a valuable resource for organizational growth and sustained competitive advantage (Miller and Shamsie 1996). In the modern world, faced with competition and increasingly dynamic environments, knowledge has become a crucial resource and a key for survival and success, not only for organizations. As is well known, an organization often does not possess all the knowledge it requires within its boundaries and, thus, it needs to look outside to gain the knowledge it lacks (Anand et al. 2002; Wasko and Faraj 2005; Pezzillo Iacono et al. 2012). For this reason, members of organizations often look for new ways to acquire knowledge from outside. One good way to do this is to create links to external knowledge resources, such as CoPs or networks of practice (Brown and Duguid 2000, 2001; Wasko and Faraj 2005).

Communities of practice, as Brown and Duguid (2001) point out, play a key role in helping maintain a company's competitive advantages for different reasons. Firstly, CoPs are significant repositories for the development, sharing, and preservation of knowledge. According to Wenger, learning is a natural and inevitable aspect of life, and a fundamentally social process. If this is true, we can see CoPs as privileged places for developing, maintaining and sharing useful knowledge for organizations. Moreover, community knowledge is more than the sum of knowledge of its members, because the latter provide social affordances for one another

(Cook and Brown 1999; Brown and Duguid 2001). Finally, community members also carry out their activities in other social contexts, such as organizations and other groups, building bridges between the different structures.

Although CoPs seem to be privileged sites for developing, maintaining, and sharing knowledge, the management of that knowledge is somewhat problematic. Indeed, there are various kinds of knowledge that must be managed in different ways. An interesting review of knowledge has been conducted by Brown and Duguid (2001), who identify various types as well as different approaches for managing them.³ Knowledge can appear as one or another type (conflicting view), such as explicit or tacit, or both (alternating approach), such as both explicit and tacit. Lindkvist (2005), by contrast, identifies two ideal-type notions of knowledge: knowledge collectivity and knowledge community. The first is related to collectivity of practice, which refers, as the author suggests, to temporary organizations and/or project groups operating within firms consisting of people, most of whom have not met before, who work together to solve a specific problem. Such groups operate in distributed contexts, where the knowledge base is highly dispersed and individualized among members rather than decentered. The second refers to CoPs, where knowledge resides in practice and thus is decentered rather than distributed (Lindkvist 2005).

Although knowledge within CoPs has gained increasing popularity in managerial literature, the management side of knowledge has been less discussed (Wenger 2004). More generally, knowledge management is a system that encompasses various forms of knowledge creation, transfer and storage. With reference to CoP literature, some scholars recognize the importance of the management side of knowledge within a community, addressing their research to one or more forms of knowledge and, thus, using an atomistic rather than systemic approach (Davenport and Prusak 1998; Wasko and Faraj 2000; Gourlay 2001; Walsham 2001; Wenger et al. 2002; Wenger 2004; Ardichvili et al. 2003, 2006). A feeble attempt to understand the process of knowledge management within CoPs by using a systemic approach can be traced back to Wenger (2004), who conceptualizes the doughnut model of knowledge management. This model emphasizes the role of the CoP in the creation and sharing of knowledge among members. Knowledge management is considered to be a strategic activity enabled by the combination of three constituent elements of CoP: domain, community and practice. In this regard, knowledge management is recognized as a recursive and strategic process (doughnut) that allows members to exchange experiences and to build expertise for carrying out work. Interacting regularly, community members share their experiences and learn from each other how to practice better within a specific domain. Although this research recognizes the CoP as a structure for shaping and transferring knowledge, it does not distinguish in depth between the various forms of the process.

³The knowledge can appear “sticky” and “leaky” (Von Hippel 1994; Liebeskind 1996). Other scholars, by contrast, classify knowledge as “know how” and “know that” or “explicit” and “tacit” (see Brown and Duguid 2001 for a review).

Next we will discuss the process of knowledge management within CoPs with particular reference to its various forms, such as creation, sharing, and preservation of knowledge.

2.4.1 Knowledge Creation and Sharing

Knowledge creation (generation) and sharing (exchange) are considered to be crucial resources for a CoP. The success or failure of a CoP, indeed, is strongly influenced by its ability to accumulate resources and to foster future growth (Ardichvili et al. 2003; Fang and Chiu 2010). A CoP consists of a tightly knit group of members who come together to share common interests and goals, with the aim of sharing information, developing knowledge and developing themselves both personally and professionally (Wenger 1998). Unlike organizations that are very formalized in structure, CoPs are fairly informal entities, often existing only in the mind of their members, who discuss and share the knowledge necessary to solve the problems.⁴ Indeed, rather than organizations, the different social systems, organizational culture and climate enable communities to exchange knowledge without much effort and, thus, more easily (Ardichvili et al. 2003). It is no coincidence, in fact, that organizations decide to create and/or support CoPs as a strong alternative to building teams (Nirenberg 1995).

Although I have clarified the role of knowledge creation and sharing in the success or failure of a CoP, the reasons that lead people to create and share knowledge still need to be explained. Prior research has shown that members have various reasons to create and exchange knowledge within a community, ranging from boosting their self-esteem to altruistic and conformist considerations (McLure and Faraj 2000). Based on this research, other scholars have tried to clarify why people are willing to contribute and share their knowledge within a CoP (e.g., Ardichvili et al. 2003, 2006; Wenger 2004; Fang and Chiu 2010).

Ardichvili et al. (2003) have conducted research aimed at understanding the reasons for participation or barriers to participation of people in community life. Active participation of members in community life has been recognized as a necessary condition for knowledge creation and sharing. In particular, the research of Ardichvili et al. (2003) is guided by the following question: what are the reasons (or barriers) for community members to contribute to knowledge creation and sharing? The findings of that research have shown that the majority of people view knowledge as a public good, belonging not to community members but to the whole organization. Thus, the willingness of community members to participate in community life, discussing ideas and exchanging knowledge, is motivated by moral

⁴Results of more recent empirical research show that within CoPs the roles, rules and tasks of members are well defined, showing the existence of structures and a hierarchy, even if these are not formalized as organizations (Metallo 2007).

obligation and communal interests rather than self-interest. On the contrary, findings also show that the reasons stopping people from contributing to knowledge generation and exchange are related to their different views of knowledge. Indeed, community members who are not willing to share knowledge view knowledge as a private asset and source of competitive advantage. However, as the authors argue (Ardichvili et al. 2003), such people are in the minority, while others are more willing to create and share knowledge for moral reasons.

Other research, instead, links knowledge creation and sharing with cultural influences (Ardichvili et al. 2006). In particular, such research has aimed to investigate cultural factors influencing knowledge sharing strategies within communities of practice. Findings have shown that cultural factors, such as modesty and competitiveness, negatively influence knowledge sharing within communities of practice. Thus, although such authors recognize the need for deep contributions on the topic, cultural influences determine the willingness (or unwillingness) of community members to create and transfer knowledge.

McLure and Faraj (2005) contribute to this topic by investigating why people share knowledge with others in networks of practice. Although a network of practice is slightly different from a CoP, some results may be generalized. In particular, the findings of such research show that individuals contribute knowledge when “they perceive that it enhances their professional reputations, and to some extent because it is enjoyable to help others” (p. 53).

According to Amin and Roberts (2008), on the other hand, the reasons that lead people to share knowledge and practice arise from interaction and relationships of proximity among community members. Proximity encourages people to interact and to communicate with each other, as well as to forge social ties recognized as crucial for knowledge sharing. If this assumption is established, knowledge sharing among members depends on the kind of community to which they belong. In particular, research has shown that the size (small or large) and the degree of technology usage (traditional or virtual) of a community influence new knowledge generation and sharing among its members (Hall and Graham 2004; Amin and Roberts 2008). Usually, smaller traditional communities of practice are more homogeneous and closed groups rather than larger and virtual ones, so enabling easier communication and greater involvement of members, which fosters the exchange of knowledge and practices. Thus, the social dynamics, and social proximity in particular, are quite different, depending on the various kinds of communities, and affect the ability of people to generate new knowledge and share practices.

Finally, other research agrees that knowledge sharing within a CoP depends on knowledge itself (e.g., Wasko and Faraj 2005; Chiu et al. 2006; Fang and Chiu 2010). According to these authors, knowledge sharing is a bidirectional process that involves both community and members. Indeed, the community accumulates resources and fosters future growth thanks to the sharing of knowledge and practices by its members. Knowledge is the key to sustaining the community as well as being the most valuable resource for its members (Fang and Chiu 2010). For these reasons, knowledge sharing is regarded as a motivation for joining communities.

2.4.2 *Knowledge Preservation*

As already shown, the academic literature identifies knowledge creation and knowledge sharing as the main reasons that lead individuals to join communities of practice. However, people may decide to join a community for different reasons than those previously identified. Among these reasons, the preservation of knowledge is one of the most important.

The reasons for this choice are very old, dating back to the beginning of human life. For instance, since the Hellenistic period people have used knowledge to build new technologies, such as the “Antikythera mechanism” (about 150 BC) and “stream turbines” (1st century AD), to improve both social life and working activity, sometimes forgetting about the technologies previously used. In both cases, the scientific and technological knowledge that produced these constructions was lost a few decades later, and people rediscovered the ability to build similar mechanisms only a few centuries ago (Schiafone and Agrifoglio 2012). Knowledge has been recognized as a crucial resource for technological advance and people have always sought ways to preserve such knowledge acquired. For instance, academic research on heritage shows that stones, papyrus and books are examples of a wide range of ancient and more recent tools used by people to transfer and store knowledge. Other research focuses on the topic of knowledge management, showing how CoPs contribute to preserving knowledge and practice over time, rather than on knowledge creation and sharing (e.g., Lazaric et al. 2003; Amin and Roberts 2008; Schiafone and Agrifoglio 2012; Agrifoglio and Metallo 2015).

Lazaric et al. (2003) focus on the crucial role of knowledge management, and knowledge articulation and codification in particular, within the steel industry. Such research shows that in the steel industry, local knowledge is often anchored in experts belonging to different communities of practice. According to these authors, such communities play a double role, contributing both to sharing knowledge among members at individual and collective levels and to accumulating and preserving knowledge at different organizational levels. Thus, the main challenge concerns the codification of knowledge that “can only be achieved by making the relevant practices explicit within different communities of practice” (Lazaric et al. 2003, p. 1830).

Amin and Roberts (2008), instead, focus on the role of the CoP in determining learning and knowledge generation across a variety of different working environments. Such research identifies various kinds of CoP (defined as knowing in action) based on their different mode of learning and knowing, such as craft/task-based, professional, epistemic/creative, and virtual. Among these, as the authors suggest, “craft/task-based activities are primarily concerned with replicating and preserving existing knowledge rather than engaging in radical innovation” (Amin and Roberts 2008, p. 359). Within craft/task-based communities, knowledge is codified and embedded within individuals and the sociocultural context and, thus, may be transferred through verbal and physical communication such as co-location, communication in face-to-face meetings, and demonstrations.

Other research, instead, explores knowledge preservation within CoPs based on empirical evidence (Schiavone and Agrifoglio 2012; Agrifoglio and Metallo 2015). Both studies aim to understand the reasons that lead people to join a CoP, showing the explicit contribution of practice preservation (Schiavone and Agrifoglio 2012) and knowledge preservation (Agrifoglio and Metallo 2015), rather than knowledge creation and sharing, in understanding phenomena.

Practice preservation has been defined as “the process by which CoP defends its core practices over time from extinction and obsolescent risks due to external factors” (Schiavone and Agrifoglio 2012, p. 333). Technological and scientific knowledge is never acquired once forever; to achieve new interesting knowledge does not mean that this knowledge will be preserved. For instance, the Multi Arcade Machine Emulator (MAME) is an example of a CoP established to preserve gaming history by preventing vintage games from being lost or forgotten when technological change occurs in the video games industry. In this regard, CoP could be considered a crucial tool for preserving knowledge because it allows the retention of knowledge and technical skills about technology that otherwise might be lost over time. On the other hand, the preservation of practice also allows the creation of new knowledge and technical skills concerning the same technology, with important results for both knowledge preservation and knowledge creation.

Finally, based on the research of Schiavone and Agrifoglio (2012), Agrifoglio and Metallo (2015) focus on the process of knowledge preservation within CoPs. In particular, the study provides evidence on different ways and techniques by which tacit and explicit knowledge is preserved within two different CoPs: the Grecià Salentina (a traditional CoP) and the WoodenBoat (an online CoP). Within the first community, tacit knowledge passes from older to newer generations by popular traditions, storytelling, folk dances and ancient working practices. Within the second, members preserve tacit knowledge by using digital tools, such as a video gallery, web TV and blog, which enable both learning and storage without time and spatial limits. Although such research denotes the natural tendency of CoPs to preserve both tacit and explicit knowledge, less emphasis is given to the preservation of systems and tools of knowledge.

The process of preservation of explicit and tacit knowledge within CoPs, with particular reference to its systems and tools, will be discussed next.

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Knowledge Preservation Through Community of Practice
Theoretical Issues and Empirical Evidence

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