Archetypes of Knowledge Communities

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Abstract. Knowledge sharing communities can be found in many organizations, but their forms and functions appear to be quite diverse. This implies that questions concerning the *functioning of communities, (*how do they work) and questions concerning *success conditions* (how to organize and facilitate them) cannot be answered in a general way. The purpose of this article is to develop the theory in this area by discovering basic dimensions along which communities differ, and by identifying basic types of knowledge communities, underlying the diversity of knowledge sharing groups. Through an analysis of the literature and of a series of communities in large organizations, two basic dimensions and five archetypes of knowledge communities are identified.

Introduction

The discussion concerning knowledge sharing communities takes place in two widely divergent frameworks, i.e. social learning theory and knowledge management theory (see below). Within the two frameworks the concept of knowledge sharing community has quite different connotations and different aspects of this phenomenon appear to be central. The framework of *social learning theory* focuses particularly on knowledge sharing and apprenticeship in informal communities of more or less co-located professionals (Lave and Wenger, 1991).

The idea of communities as breeding grounds for sharing experiences and solving problems has, however, found an open ear and eye in modern companies, looking for systematic ways of strengthening its most important asset, the know-

ledge embedded in their employees. Knowledge managers that previously focused on the development of digital information systems to capture and distribute valuable knowledge have discovered the value of 'communities of practice'.

The various needs for knowledge sharing in organizations resulted in the growth of a wide variety of channels and forms, many of which differ quite substantially from the original concept of Lave and Wenger (1991). Theoretically, however, this has resulted in a confusing situation. Some authors do not differentiate between various forms and discuss Communities of Practice as if they are all basically the same. Moreover, they provide principles and guidelines as if success conditions for all communities are more or less identical. Other scholars try to take account of the differences by distinguishing between two or three (sub) types, but their typologies are not identical. Since everyone prefers to have his or her own concepts, many new terms are invented, such as community of interest, community of commitment, interest group, network, network of practice, knowledge network, knowledge community, internal community, expanded community, formal network and epistemic community. The final effect appears to be that different names are applied to the same phenomenon and the same name appears to refer to different phenomena. The theory about knowledge sharing in organizational communities is in need of an overview of the basic types of structures, their processes and success conditions.

The purpose of this article is to analyze the processes and structures, aspects and dimensions in which these communities differ and to identify the variety of groups described. This is done by both studying the literature and by analyzing a series of concrete communities. The objective is to develop a classification model and to identify a small number of archetypes. In that way unjustifiable generalizations concerning learning and interaction in, or cooperation and facilitation of communities may be avoided.

The discussion is limited to communities of employees and workers. This may include inter-organizational communities and of course communities of governmental or university employees. But Internet communities, open networks like Yahoo groups, customer service sites, citizen action groups or neighborhood communities are outside the scope of this discussion. Not because these groups are not dealing with knowledge exchange, but because the context is not organization oriented and the dynamics in these communities may therefore have quite different characteristics.

Two Perspectives

Social learning theory

About fifteen years ago the idea of Communities of Practice was developed in the framework of social learning theory applied to organizational apprenticeship

(Lave and Wenger 1991). Studies of what were called 'communities' of tailors and meat cutters, of midwifes and copier machine maintenance men, were undertaken (Lave and Wenger 1991; Orr 1990; Brown and Duguid 1991). They confirmed the principle that professional learning is 'situated learning', where groups of co-located workers are the framework both for transferring knowledge, particularly from experienced workers to apprentices, and for developing new solutions and innovative ideas. The rationale behind the concept of situational learning is the fact that knowledge is different from simple information. It is information that is experienced and interpreted by a person, it is related to an actual situation and it makes sense to that person. Knowledge is often very implicit, not consciously articulated, i.e. it is tacit.

Like Lave and Wenger (1991), Brown and Duguid (1991) also emphasized the situated aspect of social learning in co-located groups. Their focus however was the contrast between formal and informal organizing. Formal descriptions of work (e.g., 'office procedures') and of learning courses are often abstracted from actual practice. As a result education, training and technology design tend to focus on abstract representations of work processes, to the damage actual practice. Management often assumes that complex tasks can be successfully mapped onto a set of simple Tayloristic, formalized steps that can be followed without need of significant understanding or insight (and thus without need of significant investment in training or skilled technicians). By relying on formal descriptions, managers develop a conceptual view that does not take into account the importance of non-formal practices. In their case studies Brown and Duguid discovered how the burden of linking formal descriptions to actual practice rests with communities of employees. By bridging this gap they protect the organization from its own shortsightedness. If the employees adhere to the formal approach, their company's services will be in chaos. The employees therefore develop sophisticated non-formal practices.

Summing up, central in all these ideas is the concept of 'practices', around which groups share, acquire, and create their knowledge. It is knowledge related to a common professional discipline, a skill or a topic. The focus in this perspective is on more or less collocated groups of professionals who develop a shared repertoire and resources such as routines, vocabulary, stories, symbols, artifacts, and heroes that embody the accumulated knowledge of that group. This shared repertoire serves as a foundation for future learning.

Knowledge management theory

Meanwhile management in knowledge intensive companies was looking for ways in which experiences of their employees can be shared, valuable skills can be kept in the company when employees leave, and the creation of new solutions and innovative concepts can be stimulated. In the eighties and the beginning of the

nineties all knowledge processes, i.e. acquiring, developing, storing, exchanging and applying knowledge, was regarded to benefit enormously from investing millions of dollars in 'knowledge technologies'. Procedures to elicit knowledge from employees, to convert it into a systematized form and to store it in company wide repositories were, and often still are, very popular.

This codification approach (Hansen et al., 1999) has seen many failures (Huysman and de Wit 2002), an important reason being that people find it difficult to explicitly describe their experiences and the insights they have found. Moreover, there is psychological resistance against providing and using knowledge that is separated from its owner i.e. that is made *impersonal*. Exchanging knowledge with others may provide status and is trustworthy for the receiver. Putting knowledge in a system is cumbersome, removes it from its context and rarely provides personal rewards.

Companies therefore developed new strategies with a focus on people meeting each other, on interpersonal knowledge sharing, on master-apprenticeship relations, on knowledge intermediaries ('knowledge brokers') and on knowledge networks and communities. These networks may consist of people from different and geographically distributed units of the organization. The concept of 'communities of practice' thus became related to groups of professionals from different organizational units who have a common interest in certain work related topics and share there knowledge on a regular basis.

Certain scholars and consultants in this area defined these communities of practice in a way that also included the above mentioned co-located groups of professionals. Wenger (2000) defines CoPs as follows: "*The term 'community of practice has been used for over a decade to describe social communities or groups that have cultural practices reflecting their collective learning*". Botkin (1999, 241) defines CoPs as *"highly informal groups of people that develop a shared way of working together to accomplish some activity. Usually such communities include people with varying roles and experience"*.

However, other definitions accounted for the fact that the various types of communities growing up in the era of knowledge management, were most often organizationally and geographically dispersed, depended on 'mediated communication', i.e. ICT tools, to interact, and had sometimes ample management backing. Gongla and Rizzuto (2001, 843), discussing IBM's "knowledge networks," referred to these communities as *"institutionalized, informal networks of professionals managing domains of knowledge"*. They define the common characteristics of these knowledge networks as follows:

- They are global in scope, connecting practitioners worldwide and fostering a sense of community.
- They are responsible for a domain of knowledge. This responsibility includes gathering, evaluating, structuring, and disseminating

       knowledge that is shared among community peers and across customer projects and seeing to its evolution.
- They adopt a small set of common roles for managing knowledge
- They provide opportunities for sharing tacit knowledge among community members
- They use the common enterprise-wide Lotus Notes and Domino application
- They are sponsored by a business unit and fostered where the business sees a need for managing knowledge for its core competencies or to meet customer or market demands.
- They are neither organization units nor teams.

This type of knowledge sharing group is clearly different from the more or less co-located groups of old-timer and new-coming practitioners as described by Lave and Wenger (1991) or Brown and Duguid (1991).

Research methodology

Should one conclude from the discussion above that we are talking about two completely different phenomena? On the one hand local, informal groups of experienced but traditional workers, and on the other hand, globally distributed groups of expert knowledge professionals? This would be a wrong conclusion for two reasons. Firstly in both cases the groups are supposed to focus on learning in an informal context of knowledge-eager employees. And secondly, because in actual practice one can find types of knowledge communities, that appear to combine characteristics of both (see below). Some scholars in this field have distinguished two or three types of communities, but the categorizations of these scholars are not similar. Others have identified aspects in which communities can differ, implying that those aspects can be used to differentiate between certain types of communities.

    In this article I will try to answer the question whether there are perhaps some basic forms, let us say archetypes, of knowledge sharing communities. To find these archetypes I have tried to discover whether a small set of e.g. to or three basic dimensions can be found that underlie the major aspects in which knowledge sharing communities appear to differ. When such basic dimensions can be found, concrete examples of communities can then be plotted in the (two or three dimensional) space that is defined by these dimensions. Inspection of the way these communities are clustered can then result in the identification of certain (arche-) types of communities.

    The identification of dimensions has been done by analyzing the literature in a qualitative way, and by analyzing the characterization of a number of communities in a quantitative way. This approach consists of the following steps:

- *Step 1. Identifying key characteristics.* Through a study of major publications on communities, the various aspects are identified that are used by these scholars to describe and differentiate between communities.
- *Step 2. Scoring knowledge communities.* Nine case studies in organizations have been performed, in which a variety of knowledge sharing communities were studied. These communities will be characterized ('scored') in terms of the key characteristics found in step 1.
- *Step 3. Extracting basic dimensions.* The relationships between these 'scores' are analyzed to discover underlying basic dimensions that differentiate the communities studied.
- *Step 4. Identifying ideal types.* Both the case study communities and the types of communities found in the literature will be plotted in the dimensional space. The result will be analyzed to discover basic types of communities.

Identifying key characteristics

In this section major publications concerning knowledge sharing communities are studied, to discover which aspects of communities are considered important. All authors have come to their views on the basis of practical experiences with knowledge communities. The phenomenon of organizational knowledge communities, and particularly the systematic study of them, is quite young, and therefore also well-grounded publications. The publications will be presented in chronological order.

Wenger (1998) does not give much attention to differences between various types of knowledge communities. However, he stresses that communities of practice consist of members who are informally bound by what they do together – from engaging in lunchtime discussions to solving difficult problems – and by what they have learned through their mutual engagement in these activities. Their basic purpose is to develop members' capabilities. A community of practice is thus different from a community of interest (or informal networks) that does not imply a *shared practice and interactions*, but serves only to exchange (business) information.

McDermott (1999b) uses a comparable approach. He takes the *degree of connection and identity* among members as the key dimension to distinguish between three types of networks:

- *user groups,* i.e. individuals who are all interested in certain types of information, but with hardly any interaction and a weak identity,
- *networks*, groups of people who share a common interest, exchange questions and solutions, but have limited sense of common identity and rarely meet as a network

- *communities of practice*, groups who share a common identity, history, and purpose, which is often directed at developing best practices.

Collison (1999) describes the two types of communities distinguished within the BP-Amoco Company, i.e. Communities of Practice and Communities of Commitment. The difference between the two is explained in terms of *contract value*, i.e. the degree to which the community has to deliver concrete results. CoPs have limited contract value, while Communities of Commitment have high contract value. According to Collison communities of practice are sometimes given resources by the business, often to the extent of funding a network coordinator, but do not collectively contract to deliver value to the organization. There is often no defined membership, and no fixed program of meetings, the network preferring to meet continuously but virtually. Communities of Commitment resemble to quite an extent project teams, because they were sponsored and resourced by the company, often held performance contracts or expectations, had defined membership, and a formal program of meetings with objectives and deliverables. An example was the maintenance managers' network; a network of refinery managers committed to reducing the maintenance cost to a target level fixed by the organization. From these descriptions it becomes clear that the two types of communities not only differ in contract value but also in aspects of *formalization* such as defined *composition (*only experts or experts plus newcomers) and formal agenda's.

The aspect of formalization is also taken up by Botkin (1999), stressing the aspect of visibility. He distinguishes between 'communities of practice' and 'knowledge communities'. A major characteristic of communities of practice is their informal structure, spontaneous origin, and therefore their (in)*visibility*. Knowledge communities are "*purposely formed - some like those at AT&T even have formal membership lists - and their purpose is to shape future circumstances. They are highly visible to every businessperson in the organization*". Both types of communities contain members with a common passion to create, share, and use new knowledge; in both cases participation gives a sense of identity. CoPs however are informal groups, with open *boundary*, while the knowledge communities have sometimes closed boundary.

Allee (2000) refines the above-mentioned distinctions between two types of communities, by distinguishing 'internal and extended communities of practice' and knowledge and business networks'. She makes these differentiations on the basis of two related dimensions, i.e. *'relationships'*, from simple to complex; and *'connectivity'*, from tight to loose (see figure 1).

On the one end of the continuum are work groups and project teams, who have clear membership and connectivity. At the other end are informal knowledge networks and business networks where relationships are always shifting and changing. The knowledge and business networks serve primarily to pass along

information. They are not held together by a joint purpose, so they are very loose and informal.

Work Groups	Project teams	Internal CoPs	Extended CoPs	Knowledge Networks	Business Networks
Tight		*Connectivity*			Loose
Simple		*Relationships*			Complex

Figure 1. Different types of communities and networks (after Allee, 2000)

Brown and Duguid (2001) show that effective knowledge sharing and creation also can take place in large loosely coupled groups. This happens where large groups have a common practice, such as in scientific associations. *'Where practice is common, communication can be global'*, and so scientists from all over the world can share knowledge, even without knowing each other. But Brown and Duguid prefer to call these groups 'Networks of Practice' (NoPs), since most members will never interact or know each other. NoPs consist of members from various organizations and have a much larger *size*, but with less '*reciprocity*', than CoPs that are internally focused, tight-knit groups who work together on the same or similar tasks. Thus people know each other, which results in high reciprocity. NoPs work on a similar domain, but may never meet, don't take action and produce little (creative) knowledge.

Where Brown and Duguid point at inter-organizational membership as an important determinant of reciprocity and identity, various authors (e.g. Kimble, C., Hildreth, P., and Wright, P. 2000; Ruuska and Vartiainen, 2003; Andriessen et al. 2004) regard *geographical distribution* and *mode of interaction* as a major determining factor concerning interaction and identity building. Some communities consist of members working relatively close together and have mainly face to face meetings. Other communities however are geographically widely distributed and interact mainly electronically or combine the two modes of interaction.

Finally, developmental stages of communities may in some cases be considered as separate types. In the literature two types of stage models are to be found, i.e. life cycle models (from birth to death) and evolution models (from low to high level of maturity). Wenger (2000) and McDermott (1999a) present a life cycle model with stages such as planning, start-up, active, sustain/renew, and close. Gongla and Rizzuto (2001), however, present an evolution model of stages, based on their experience in IBM. The model describes how communities transform themselves, becoming more capable at each stage.

The first two stages are for developing and defining its existence. During these stages and the 'engaged stage' access to one another as community members and individual learning are key functions. At the 'active stage' members are working together to solve business problems and to exploit business opportunities. They

make the community's shared knowledge available to external groups. At the adaptive stage, a community has moved to a level where it senses and responds to external conditions. At this stage, the community innovates and generates, creating significant new business objects—new solutions, new offerings, new methods and new processes. In their view communities can mature and dissolve at any one of these stages beyond the initial formation level. It does not appear to be fruitful to regard the stages in a life cycle model as separate types of communities, but certain stages in evolutionary models may be considered as such because the *purposes* of the community change radically.

	Potential	Building	Engaged	Active	Adaptive
Definition	A community is forming	The community defines itself and formalizes its operating principles.	The community executes and improves its processes.	The community demonstrates benefits from knowledge management and the collective work of the community.	The community and its supporting organization(s) are using knowledge for competitive advantage.
Fundamental Functions	Connection	Memory and context creation	Access and learning	Collaboration	Innovation and generation

Table 1: Stages in the evolution of communities (Gongla and Rizzuto, 2001)

The issue of purpose is further differentiated by Andriessen et al. (2004). On the basis of various case studies they came to the conclusion that all communities exist for knowledge sharing, but that this knowledge sharing appears to serve several functions. These functions can be arranged on a dimension of individual versus organization orientation:

1. solving immediate individual problems, e.g. through sending of and responding to 'who can help me on this problem'-emails in networks of professional
2. exchanging experiences, individual learning and building a wider perspective on the practice the group is working in
3. developing best practices, manuals, guidelines for the organization
4. developing innovative solutions for the organization.

Apart from what Collison (see above) called the informal 'communities of practice' and the formal and strategic 'communities of commitment', Andriessen et al. identified two other types of communities, i.e. '*daily practice communities*' and '*problem solving communities*'. The first type consists of employees from different organizational units, in near physical proximity, coming together regularly and face to face to discuss issues of common interest (see AtosOrigin's Expertise Groups, next section). These groups resemble to some extent the original craft based communities of practice described by e.g. Lave and Wenger

(1991) and Orr (1991), in the sense that they are working in relatively close proximity, include experts and new comers, and meet mainly face to face. The 'problem solving community' consists generally of a large number of geographically and organizationally dispersed employees of the same discipline, such as all 500 Oracle employees in Europe and Africa working with ERP systems (see next section). Through the ICT network they exchange questions and answers concerning the solution of certain practical problems.

Table 2 summarizes the key characteristics of knowledge communities that were identified by the various authors.

- *Contract value*: degree to which the community has to deliver concrete results (Collison 1999).
- *Purpose*: Having a common mission versus only exchanging information (Allee), or also: having an organizational orientation, i.e. developing best practices or even innovative solutions, versus an individual orientation, i.e. exchanging information for solving personal problems and learning (Gongla and Rizzuto 2001; Andriessen et al. 2004).
- *Defined membership*: whether the community is closed or open for new members (Collison 1999; Brown and Duguid 2001), having fixed or shifting relationships and membership (Allee 2000).
- *Degree of formalization*: having more or less formal meetings and an appointed coordinator (Collison 1999); formally set-up by management and clearly visible to management (Botkin 1999)
- *Composition*: only experts or both experts and newcomers (Collison 1999).
- *Reciprocity* (connectivity): degree to which members interact mutually and know each other (Brown and Duguid 2001; Allee 2004)
- *Identity*: Feelings of cohesion, trust and belongingness (McDermott 1999a; Botkin 1999);
- *Intra- or inter-organizational* (Brown and Duguid 2001)
- *Geographical dispersion* (Kimble et al. 2000; Ruuska and Vartiainen, 2003)
- *Size* (Brown and Duguid 2001)
- *Type of interaction*: face to face and/or via ICT (Kimble et al. 2000; Ruuska and Vartiainen, 2003).

Table 2. Key aspects of knowledge sharing communities

This list of aspects will be used to characterize a series of communities that were studied by our group in recent years (Andriessen et al. 2004). The relations between the characterizations of the various communities will then be used as the basis for discovering basic dimensions.

Case studies

In this section case studies concerning a variety of communities will be presented. In the next section they will be characterized in terms of the aspects that were identified in the previous section.

Unilever

Unilever is a multinational company specializing in consumer products in the areas of food, cosmetics and detergents. The company has subsidiaries in approximately 90 countries worldwide. A corporate level unit has started initiatives such as 'Knowledge Workshops' to enhance knowledge sharing and to improve innovative processes. The first knowledge workshop was organized when the company faced problems in the processing of tomatoes, and gave birth to a community of experts. Setting up communities at Unilever now proceeds quite formally. A high level management 'champion' is committed and together with him ten to twenty organizationally and geographically distributed employees are selected carefully and then asked to join the community. The experts are brought together for a workshop of about a week, to exchange information, to organize the group and care for teambuilding. A facilitator coordinates the group activities. A handbook for facilitators has been developed. The communities are globally dispersed, but certainly in the beginning ICT was hardly used for their communication. One reason appeared to be the incompatibility of the ICT platforms used in the various companies. Moreover, because of their strategic nature many communities are able to have face-to-face meetings once or twice a year.

AtosOrigin

AtosOrigin provides ICT services including consultancy, implementation and system integration. These services are provided world wide, with a total of 28,000 staff. Six thousand staff are based in the Netherlands in various geographical locations. Within AtosOrigin in the Netherlands, there are three types of communities, i.e. (local) 'Expertise Groups', (national) Networks of Performance and (national) Performer Groups.

  Expertise Groups are initiatives within (Dutch) regional sections of the AtosOrigin company. They consist of consultants working in that section, who exchange experiences concerning a work related topic. Examples of CoPs are those focusing on Oracle Databases, on Microsoft software, or on Java programming, but also one concerning Project Management. They come together face to face about once a month. The meetings consist of presentations, talks about projects, sharing literature or new ideas learned in courses attended. They have a formally appointed leader. Most groups have also social events to support the process of building group identity and trust. Each consultant in that section of the company has to be member of at least one Expertise Group and – in some regions - can be a secondary member of one or two others. The use of ICT is very limited since the main interactions take place during the monthly meetings.

  Networks of Professionals (NoPs) are bottom up growing networks of company employees, distributed nation-wide. The goal of NoPs is not only to

exchange but also to create new knowledge. The topics of the NoPs are to some extent parallel to those of the expertise groups. NoPs have to have at least five members in order to be granted official status and be given company backing and support. There are no rules relating to membership or functioning of the community. Individuals are free to join a NOP and may be member of more than one such group. The members interact through various ICT tools, but some also organize now and then a face-to-face meeting.

Performer Groups (PGs) are particularly focused on developing and storing best practices and guidelines for project management in certain domains. The storage is done in a dedicated software tool called Performer. The groups cannot be established without management approval, and employees wishing to join a Performer group must formally request membership via the group moderator. Anyone who is a member of a performer group can add information to the shared database, although the moderator has the final decision on whether items added to the database should be altered or removed. Staff that make requests for information contained in the Performer database may be granted access, although they will not become formal members.

Delft Cluster

Delft Cluster (DC) is a consortium of five organizations in the Netherlands specializing in the area of sustainable river-delta development. The consortium consists of research institutes and companies. This network of organizations was formally established in 1999 and is sponsored by the Dutch government. DC has defined seven themes of expertise and each of these themes has defined several projects in which interested sector organizations can participate. The projects contribute to the overall DC goal to strengthen its knowledge and position in the field of sustainable river-delta development. The five organizations have a common goal of developing and sharing knowledge about river-delta development, but at the same time they can be competitors when trying to acquire commercial or scientific projects. Members of the organizations meet each other in knowledge sharing communities but also in various kinds of other interactions such as research programs, projects or advisory boards. The DC cases give therefore many examples of 'overlapping memberships'.

The communities have varying practices concerning interactions: formal meetings, informal gatherings connected to other meetings such as committees or conferences. The role of ICT is rather limited. Most people involved have there own email facilities, but the communities as such are hardly supported by proprietary systems. DC has tried to introduce a groupware tool for all communities to use, in order to overcome incompatibility of systems used.

Oracle

Oracle Corporation is the world's second largest independent software company. The company offers its services in more than 145 countries around the world. Oracle's Europe and Middle East Africa (EMEA) division has over 12,000 employees and is host to over half of Oracle's subsidiaries. Communities of practice (or 'Professional Communities' as they are widely known in Oracle) existed for many years as informal networks of experts with common interests who regularly shared 'tricks of the trade'. However, since the year 2000 there has been a concentrated effort in EMEA to formalize some of these communities. This effort focused on building structured communities of practice that have a specific business purpose and reason for being. On the other hand 'communities of interest' which have no formal structure or sponsorship still play a role in peer-to-peer communication and collaboration.

Currently about 3,500 employees in EMEA (around 30%) are members of one or more communities, such as on systems for ERP, for Customer Relations Management or on Java development. There are over 80 CoPs, with sizes ranging between 17 members to about 500. The main goals of the CoPs are to spread and increase member knowledge, to develop professional skills, to help members to resolve problems quickly, and to help recruit and retain talent within the corporation. The problem solving function appears to dominate in many CoPs.

In all CoPs membership is open to anyone who wishes to join or is interested in the area. Oracle employees must be member of one community, although the employee can choose which PC to join. Each community is led by a formally recognized 'Community Leader' who is usually a well-respected subject matter expert with good leadership skills. The majority of these leaders have this role in addition to their primary role within a country organization and not as a full time job. In many of the most active communities the leaders are supported by a group of core members who drive the community with their active participation. A Professional Community Leader Bonus Award Program is in operation and this provides some assessment of the functioning of the Oracle communities.

Habiforum

Habiforum is the Dutch expert network for multiple space use, established to initiate and stimulate innovations in this area. To reach that goal Habiforum has set up approximately ten Communities of Practice. Every community within Habiforum is initiated by contracting a so-called core-team, which then attracts other members. All the communities within Habiforum are supported by a website for sharing documents and finding information on the topic and the members of the community. This website is sparsely used by the community, but face-to-face meetings and excursions are successful. We had the opportunity to study two of these communities in-depth, the communities MultiSpace and

Transferia (fictitious names). The core-team of MultiSpace unites five persons of four different companies and institutions active in this field: three consultants, an architect and a researcher. It focuses on multiple space use in industrial estates. To find more members for the community the core-team relied on their networks of clients and colleagues. In the community mainly local authorities are represented, but also real estate developers and researchers. These institutions had to pay a fee to become a member. Membership of the community includes free access to all activities for at least two of their employees and free access to the closed part of the website of the community. One type of meeting that is organized to stimulate knowledge sharing is the so-called Pressure Cooker, a 24-hour meeting combining social activities with intensive brainstorm sessions.

The community Transferia (pseudonym) consists of a group of top-level managers of various organizations associated with the issue of developing transport connection points, so-called transferia. This closed group meets about 4 times a year to discuss the possibility of finding *integrated* solutions for the design of such transferia, instead of the traditional way of having one-to-one meetings between project developer and each of the related organizations. These top managers meet to exchange their experiences and viewpoints but also to make deals with their colleagues in an informal setting. Apart from having meetings, the top managers also have excursions to existing transferia, where they interview people at the spot. In this way they can bridge the distance between their high-level office position and the reality of the design and functioning of transferia.

Our group studied all the above-mentioned communities personally. Information about one other knowledge sharing communities could be derived from direct communications with expert informants, i.e. the community of Shell drillers.

Shell

Shell is an oil company of Dutch - British origin. The organization is divided among the three basic businesses of oil, chemicals, and exploration and production (E&P). The 'division' of E&P has ca. 30,000 employees, of which about 70% is member of some kind of network. In 1998 Shell contained many small communities of 20 to 300 members. The groups were mostly informal in origin, with hardly any structure or facilitation. In 1999, the small groups were combined into global networks called communities of practice. In E&P communities can be found on the issues such as sub-surface processes, of surface processes and of wells. Such CoPs may have 1500 to 2000 members. Smaller communities are dealing with issues of e.g. competitive intelligence or of Human Relations. The communities have so-called 'hub-coordinators' for facilitation. The role of most communities is limited to daily problem solving. They serve mainly as a source of information for those members who have a problem in their work

and seek the expertise of colleagues to solve this problem. Embryonic subgroups may form for a short time, discussing a specific issue. Members do not meet face-to-face, but send their questions and reactions via a simple email discussion list facility. A department responsible for working standards regularly analyses the email messages to find elements that may be turned into standards. In this way shared knowledge is turned into organizational knowledge.

Basic dimensions and archetypes

The communities discussed above were characterized in terms of a low, middle or high position on each of the identified aspects. The scores for each community can be found in the Appendix (Appendix, Table I). The analysis of the data in Table I of the appendix proceeded in two steps. First the scores of the nine communities on the eleven aspects were visually compared. Through inspection it was clear that the scoring on some aspects were completely identical. For the rest correlation coefficients (spearman rho) were computed. On first sight the set of communities presented seems to be a very small sample and too limited to calculate correlations. However, one has to take into account that some of these communities stand in fact for a series of 'sister-communities'. We studied in detail only one Unilever community, but several other Unilever communities have about the same characteristics. Of the AtosOrigin communities we studied in fact four expertise groups, while in the Oracle Company we studied six communities.

   It appeared that certain patterns of scores were highly related, resulting in the identification of two clusters of aspects, which can be considered to be two basic dimensions for differentiating knowledge communities. It must be noted that the identification of clusters of related aspects does NOT imply that all the aspects in one cluster are basically identical. Aspects are placed in the same cluster because they tend to go together in the communities studied. Nevertheless, the discussion below will highlight that there are good reasons to speak of two underlying dimensions.

   The first cluster: Institutionalization. The patterns of scores on the first five aspects in table 4, were either the same (contract value, composition and boundary) or correlated higher than rho=.80, p<.01[1] which each other, while correlating low with other aspects. These relations imply that the purpose of having organizational knowledge development as objective goes together with having strong accessibility rules and institutionalized coordination, in short: high formality. On the other hand, a focus on individual learning and problem solving is found in communities, which are open for new members and have relatively

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[1] This is a spearman correlation, significant at the .01 level. Since the number of observations is small and the number of aspects relatively large, these correlation coefficients have to be interpreted with care.

low formalization. This dimension is called '**institutionalization'.** Size appears to be quite strongly negatively related (rho= -89, p=.001) to the aspects in this cluster, particularly to formalization. It indicates that the highly institutionalized communities are obviously quite small, compared with the less institutionalized ones.

The second cluster: Connectivity. Also the pattern of the community scores on the Reciprocity (level of interaction between members) and Identity (having feelings of cohesion and belongingness) dimensions were almost completely identical. This dimension is called '**connectivity'.** Interestingly, size is also related to this cluster, i.e. rho= -.62 (p=.04) with reciprocity and rho= -.71, (p=.016) with identity. This suggests that the smaller the communities, the higher the connectivity.

The three last aspects, i.e. being intra- or inter- organizational, geographical dispersion and mode of interaction, were also expected to form a cluster. This was based on the idea that organizational dispersion would imply geographical dispersion, and that dispersed group members would communicate by electronic means. However, neither substantial relations amongst these three aspects, nor with the other aspects were found. As far as we can conclude on the basis of this set of communities, it appears that intra-organizational communities can be as widely dispersed geographically as inter-organizational communities. Formulated in this way, this is quite plausible, given the multinational character of many of these companies. More remarkable however is that some highly dispersed communities, such as the globally dispersed Unilever community, are not communicating more in mediated ways than less dispersed communities. It supports the notion that face to face meetings are deemed to be of high importance, even for community members working at a great distance from each other.

The two dimensions are represented in figure 2 and the eleven knowledge sharing groups presented above are plotted into this two dimensional space (bold), on the basis of their factor scores. Added are also the types of knowledge communities described by the authors presented in section 5. These communities are not specific concrete communities, such as the bold ones, but generalized types. However, they are derived from experience with real knowledge communities in companies and described in sufficient detail in the literature to be positioned quite well in figure 2. The patterns in figure 2, and also the discussion in section 5, suggest that knowledge communities cluster in four, or perhaps five, types:

1. Informal communities: Groups of employees with a common area of interest, often closely related to their work (practice), with substantial interaction, a common history and 'culture' (shared concepts, ideas, stories etc). Their main purpose is to learn from each other; transfer of this common knowledge to the company is of less importance. However, some organizations recognize the

potential gap between individual learning and organizational learning and nominate specialists who have to analyze what is discussed in these communities and who may turn this harvest into new ideas, concepts and guidelines for the organization.

These communities are generally not very formalized, although some may receive support when they have proven their value. These groups are to some extent similar to the original Lave and Wenger (1991) communities of practice (although geographically and organizationally much more dispersed), which may be the reason that most of them are called 'Community of Practice', while most other knowledge sharing communities receive other names. These communities grow spontaneously, are either small altogether or have a small core and a larger circle of peripheral members. Two success conditions are probably found in a very active coordinator or core group and adequate ICT support.
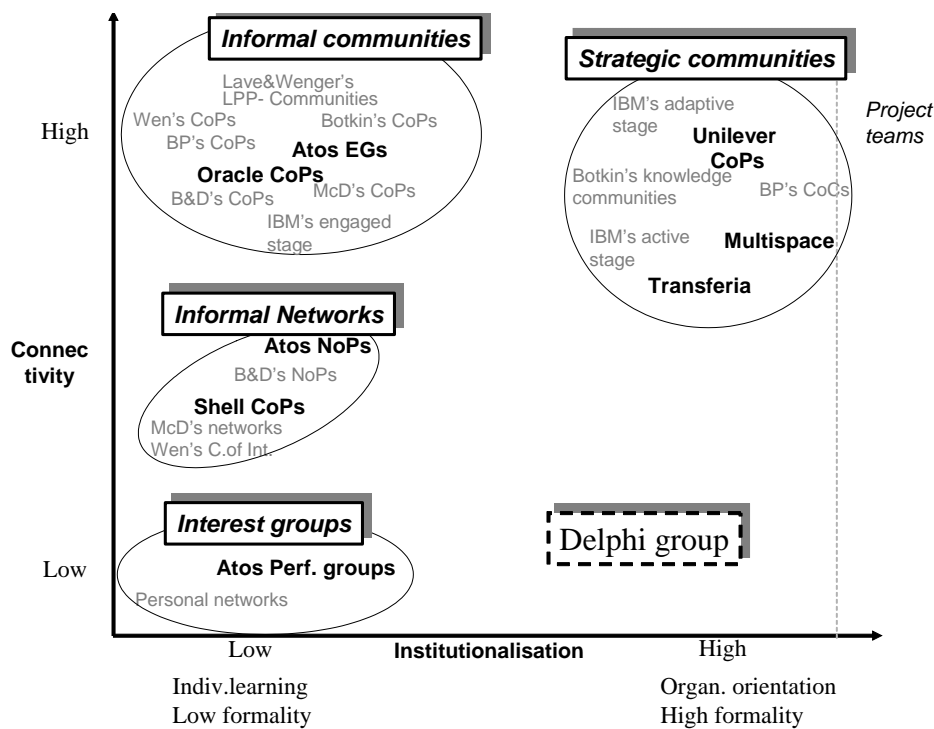

Figure 2. A classification of knowledge sharing groups in three dimensional space
B&D=Brown and Duguid; BP=British Petrol; McD=McDermott; Wen=Wenger

2. Informal Networks. Between the Informal Communities and the next (third) type, i.e. the Interest Groups, many scholars identify a group with intermediate interaction and identity. Brown and Duguid (1991) speak of Network of Professionals, who consist of members from various organizations and are much larger than what they call CoPs. The members of NoPs work on a similar domain and communicate, but may never meet and don't take common action. McDermott (1996b) speaks of networks of people who share a common interest, exchange

questions and solutions, but have little sense of common identity and never or rarely meet as a network. Andriessen et al. (2004) identify the Problem Solving Community, consisting of employees of the same discipline, exchanging questions and answers concerning the solution of certain practical problems. Although the size may be quite large they still display some form of group identity, based on commonality in function and organization. Informal Networks have limited purposes and seem to thrive without many success conditions, except minimal commitment and good email connections.

3. Interest groups, i.e. groups of people who have no other interest than to hear and learn individually about a certain topic. These groups have very low formality, members come in and leave easily, there are no clear boundaries and also limited interaction and identity. Most members do not interact or know each other and the main knowledge exchanging activity is often that individual members all interact bilaterally with the same information source. These groups are often very large. Some are the totality of all employees who consult the same company intranet and have as common identity only the fact that they are all member of the same company. All these groups have a high virtuality, i.e. communication in this type of community is through electronic means. Actually the existence of Intranets and other electronic means have given rise to this type of networks. The quality of Interest Groups is a.o. dependent on the quality of the information provided and the accessibility of the website.

4. Strategic communities i.e. groups of experts having the same sense of common culture and identity as Informal communities. However activities are more oriented towards *organizational learning*. They are highly supported with resources and have a strong 'contract value' i.e. they are expected (implicitly or explicitly) to perform for the company; develop best practices or even innovative solutions. They often consist mainly of a limited number of experts, without any periphery of 'lurkers', since membership is not open. In some cases (like BP's Communities of Commitment), these groups resemble project teams and sometimes cross the border between knowledge communities (learning oriented) and workgroups or task forces (product oriented). Like most knowledge communities in large companies, many of these strategic communities are organizationally and geographically distributed and communicate therefore electronically. Some of them however do limit their interaction mainly to face-to-face meetings. Strategic communities require intensive preparation, member selection, support and coordination to be effective.

5. The Delphi community? The existence of a fourth but empty quadrant in figure 2 raises the question whether there exists a fifth type of community. This would imply a network of professionals, with high organization (and innovation) orientation and with high formality, but with low interaction and common identity. A social structure with these characteristics seems at first sight to be quite a strange phenomenon. High formality, such as reflected in a selective recruitment of members, having rules and roles, such as a coordinator, seems to

be difficult to combine with lack of interaction and group feeling. Nevertheless it is possible to imagine theoretically such a phenomenon (although it would probably not be called a 'community'). It would consist of a number of selected experts, who do not interact reciprocally and have no cohesion whatsoever. However, a coordinator would deal bilaterally with these experts, and he could 'extract' innovative ideas for the company through a kind of Delphi methodology. This methodology implies that the experts provide opinions and ideas and react upon the suggestions of the other experts. This is a kind of knowledge sharing. Although I do not know of the existence of such a group, it may serve the purpose of exchanging knowledge for the sake of both personal learning and organizational innovation. It would therefore belong to the 'family' of knowledge sharing groups.

Discussion

The analysis in this article has resulted in the identification of five archetypes of knowledge sharing communities, of which one, the Delphi community, has not been found yet in community research, but is at least theoretically possible. The Strategic Community is characterized by high interaction and identity and also high formalization, existing only of a 'core' of members. The Informal Community has high interaction and identity, but low formalization. It often consists of a core of active members and a large periphery (and possibly 'cliques'). Informal Networks have medium interaction and low formality. Generally there is no core – periphery differentiation. Interest Groups have both low interaction and low formalization and may be said to exist only of peripheral members. The Delphi Community finally has low interaction and identity but high institutionalization. There is no core and no periphery, but only a process of 'extraction' of information by a coordinator. Of course these are ideal types, which means that in actual practice communities may be found that have characteristics of more than one type or oscillate between types.

   Having identified four or perhaps five basic types implies that one should be very careful with *terminology*. Different terms have been used such as community of practice, community of interest, community of commitment, interest group, network, network of practice, knowledge network, knowledge community, internal community, expanded community, formal network and epistemic community. Some terms denote the same phenomenon, while for instance the same term of 'community of practice' has been applied to different types of communities, that is, to strategic communities, to informal communities and to informal networks (seldom to interest groups). I make a plea for indeed employing a wide definition for the term 'community of practice', in such a way that it covers each of the three archetypes.

   Dispersion or technology. Two dimensions appear to be sufficient to describe the main differences between communities and to identify the five archetypes.

The expectation concerning the existence of a third dimension, i.e. 'dispersion', including mode of interaction, was not supported. Our studies, however, suggest that differences between *business unit* communities*, organization communities* and *inter-organizational communities* appear to be quite strong. The differences between intra-organizational communities (level 1 and 2) and inter-organizational communities (level 3) are rather strong and essential. Identification, and particularly formalization is quite different in nature for these two 'levels', which may imply that we should distinguish in all five archetypes *an A-type (intrA-organizational) and a B-type (Between-organizational).*

Dynamic changes. The concept of 'archetype' should not be associated with stability and clarity of boundaries. On the contrary, communities are generally quite loosely institutionalized, with shifting membership and also shifting purposes. Particularly a shift of purpose over time is quite common. Actually, communities are not static but dynamic. Classification may help in the identification of certain characteristics and in developing support, but communities often change in nature. In a previous section the difference between life cycle dynamics and evolutionary dynamics was expounded.

A third type of dynamics may be called s*ubgrouping*. In our experience communities thrive and change also through the emergence of subgroups. The purpose of these subgroups may be to prepare a special meeting, to develop a certain plan, which is afterwards again discussed in the whole community, or just to communicate about a special issue that may not (yet) be interesting for the whole community. An example is what happened in the Oracle community of the AtosOrigin company, where a subgroup of members developed a plan to transfer their experience in the newest Oracle database design methods to the rest of the company.

Research agenda: The central dimensions and the archetypes have been identified on the basis of an in-depth analysis of literature and case study material. Together they can be viewed as a theory about the variety of knowledge sharing groups. Empirical research is needed however to confirm or specify this theory. This implies particular attention to the following questions:

- Do the various aspects in actual practice indeed correlate as stated, and are institutionalization and connectivity indeed basic dimensions for mapping knowledge sharing groups?
- Do the first four archetypes indeed crystallize at the indicated places in the 2- dimensional space, or are they to be found 'all over the place' i.e. can they have all combinations of the two dimensions?
- Are the A-type (intra-organizational) and B-type (between-organizational) to be found in each archetype and are the differences in each archetype comparable?
- Is the Delphi community a viable knowledge sharing community? Does it exist already?

- What are the success conditions for the various archetypes?

To achieve answers to these questions it is necessary to compare systematically the characteristics of many diverse knowledge-sharing communities. Towards this end a research program and standardized assessment tools have been developed (Andriessen and Verburg 2004).

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Appendix

- Purpose: 1=individual organization; 2= both; 3=organizational orientation (ORGORI)
- Contract value: 1=low; 2= medium; 3=high (CONTRAC)
- Formalisation: 1=no appointed leader, few rules and procedures; 2=appointed leader; 3=appointed leader, several rules and procedures (FORMAL)
- Composition: 1=all kinds of members; 3=only experts; (no score 2) (EXPERTS)
- Boundary: 1=access for anyone; 2=limited membership access; 3=closed membership (CLOSED)
- Reciprocity: 1=low level of interaction; 2=medium; 3=high level (RECIPROC)
- Identity: 1=low level of shared feeling of group identity; 2=medium; 3=high level (IDENTITY)
- Size: 1=10-40; 2=41-150; 3= >150 members (SIZE)
- Intra-organizational: 1=Interorganizational; 2=Intra-organizational but from different business units in very large companies; 3=Intra-organizational in relatively small companies (INTRA-ORGAN)
- Geographical dispersion: 1=local; 2=national; 3=international (DISPERSE)
- Mode of interaction: 1=mainly face to face communication; 2=both; 3=mainly ICT based communication (ICTUSE)

Table A. Meaning of scores for each key aspect.

	Uni-lever	Atos EG	Atos NoP	Atos PG	Transf eria.	Oracl e	Multi space	Shell Drill	User Grp
Purpose	3	1	2	3	2	1	2	1	1
Contract Value	3	1	1	3	3	1	3	1	1
Formalization	3	2	1	3	3	2	3	1	1
Composition	3	1	1	3	3	1	3	1	1
Boundary	3	1	1	3	3	1	2	1	1
Reciprocity	2	3	2	3	2	2	2	2	1
Identity	3	3	2	3	2	2	2	2	1
Size	1	1	2	1	1	2	1	3	3
Intra-organ.	2	3	3	3	1	2	1	2	1
Geogr. Dispersion	3	1	2	2	2	3	2	3	3
Mode of interaction	2	1	3	3	1	3	1	3	3

Table B. Scoring of the communities on the key aspects

	Orgori	Contrac	Formal	Experts	Closed	Reciproc	Identity	Size	Intraorg	Disperse	Ictuse
ORGORI	1,000	**,833**	*,705*	**,833**	**,857**	,272	,508	*-,646*	-,129	,186	-,159
CONTRACT	**,833**	1,000	**,926**	1,000	**,968**	,207	,387	**-,767**	-,509	,139	-,484
FORMAL	*,705*	**,926**	1,000	**,926**	**,896**	,394	,538	**-,892**	-,505	,133	-,598
EXPERTS	**,833**	1,000	**,926**	1,000	**,968**	,207	,387	**-,767**	-,509	,139	-,484
CLOSED	**,857**	**,968**	**,896**	**,968**	1,000	,245	,458	*-,742*	-,408	,169	-,396
RECIPROC	,272	,207	,394	,207	,245	1,000	**,846**	*-,623*	,240	-,080	-,245
IDENTITY	,508	,387	,538	,387	,458	**,846**	1,000	*-,711*	,169	,129	-,292
SIZE	*-,646*	**-,767**	**-,892**	**-,767**	*-,742*	*-,623*	*-,711*	1,000	,266	,118	*,742*
INTRAORG	-,129	-,509	-,505	-,509	-,408	,240	,169	,266	1,000	-,486	,508
DISPERSE	,186	,139	,133	,139	,169	-,080	,129	,118	-,486	1,000	,269
ICTUSE	-,159	-,484	*-,598*	-,484	-,396	-,245	-,292	*,742*	,508	,269	1,000

Bold: Correlation is significant at the .01 level (1-tailed).
Italic: Correlation is significant at the .05 level (1-tailed).

Table C. Spearman Rho correlations between the key aspects of knowledge communities. On the number of observations, see the discussion in section 7.