

Group dynamics and CoPs

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Communities of practice (CoPs) are considered to be important elements in the strategy concerning knowledge exchange and innovation of many organisations. At Delft University of Technology we are studying communities of practice in different (networked-) organisations and would like to bring in our experiences for the workshop of ECSCW. In our research the main issues are concerned with on the one hand the characterisation of CoPs and on the other hand the identification of the conditions – and particularly the role of ICT support – for successful functioning of Cops

1. Four examples

In this section we will describe shortly the way four large companies are dealing with CoPs. The information is based on a case study we have done ourselves (Unilever) and on contacts with key informants of the other organisations (Shell, Siemens, BP-Amoco).

Unilever

The Knowledge Mapping and Structuring Unit at corporate level has started initiatives such as 'Knowledge Workshops' and 'Communities of Practice' (CoPs) to enhance the efficiency of production and to improve innovative processes. In these initiatives, both knowledge exchange and knowledge creation processes play an important role. The first knowledge workshop was organised when the company faced problems in the processing of ketchup. Many experts concerning the production of ketchup were brought together. As an unforeseen phenomenon the workshop gave birth to a community of experts, which was later called a 'community of practice'. At this moment the practices of the communities at Unilever concentrate mostly around certain production processes (e.g. of

margarine and ketchup), but CoPs can also be found concerning principles of supply chain management and quality norms.

Setting up communities proceeds quite formally. A 'champion' is committed and together with him ten to twenty employees are selected carefully and then 'asked' to join the community. When they accept to join they receive a special position within their department. From that moment they are considered to be representatives of their department. Through this process the CoPs become a homogeneous group of experts in a certain field.

The experts are brought together for a workshop of about a week, to exchange information, organise the group and for teambuilding. A facilitator co-ordinates the group activities, with the help of a handbook that is developed by the corporate Knowledge Structuring and Mapping Unit. The group is expected to communicate continually, but in actual practice the most intensive communication occurs during and around face to face meetings, that take place once or twice a year.

Shell

Shell is an oil company of Dutch - British origin. The organisation 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 CoPs and Communities of Interests 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. These groups are quite large and have a formal position in the organisational structure. In E&P communities can be found on the issues of sub-surface, of surface and of wells. Each CoP has 1500 to 2000 members. Smaller communities are dealing with issues of knowledge sharing, of competitive intelligence and of HR aspects. The communities have so-called 'hub-co-ordinators' for facilitation. They meet with other co-ordinators once in three to four months. They are responsible for the co-ordination of all activities within the various communities.

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 discussion list facility. This means that the learning that takes place is single loop learning, rather than double loop, innovative learning (Argyris, 1992). However, the department responsible for working standards regularly analyses the emails to find elements that may be turned into standards. In this way shared knowledge is turned into organisational knowledge.

Siemens

Siemens is one of the largest electrical engineering and electronics companies of the world. It employs 447.000 people. The communities for learning and knowledge sharing are called 'communities of excellence' (CoEs). These communities range from small to quite large, and focus on 'practices' such as sales. The communities have to transfer their collaborative knowledge into deliverables for the organisation.

Siemens facilitates its communities with a global intranet, called ICN ShareNet. Every user has his own personalised workspace. These workspaces on the Intranet relate to discussion groups, urgent requests, yellow pages and chat functionalities. Knowledge and information can be found through search, links and news. The communities have coordinators in the role of ShareNet managers. They have to co-ordinate the groups and are responsible for reviewing messages and for knowledge development.

BP Amoco

BP Amoco is the third-largest oil and gas company in the world. The organisation was formed at the end of 1998 from a merger between British Petroleum (BP) and Amoco. It consists of 126 business units in over 100 countries and employs over 80.000 people. Knowledge is considered to be very important to the organisation. The CEO stated that anyone who is not directly responsible for profits (sales), needs to provide knowledge that is useful for the organisation as a whole.

Knowledge sharing was originally organised through formal networks, in which people meet regularly face-to-face. Later, a large number of informal networks (CoPs) began to grow, sometimes on the basis of already existing loose affiliations of practitioners. The CoP-concept then helped to legitimise them and gave them direction and impetus. Examples of communities are those on '3D reservoir modelling', 'production efficiency' and 'water produced during drilling'. Since the merger with Amoco, the organisation has developed the so-called 'dual (formal - informal) network model' (Collison, 1999). There is no defined hierarchy in the communities of BP Amoco, but in practice certain experienced members answer most of the questions at discussion groups and are active in steering and summarising discussions. Approximately half of the community-members participate in such discussions, while the others do not.

Because most communities do not meet face-to-face they rely on ICT. The tools used at BP Amoco are quite sophisticated, include email, public folders, discussion groups and shared documents. The networks can use various means for facilitation, such as a network facilitator (who co-ordinates the activity of the network), several means of communication (both face-to-face and virtual), a common storage facility for community knowledge (LINK-tool), and the Connect tool (yellow pages).

Two things proved very important in this BP Amoco case. First, it appeared to be vital to establish ownership with the employees. This implies that people might use the tools better or more frequent if they feel the need for it (helping their job). Second, the human resource department can create the right conditions, such as training. Although the use is voluntary, people can be offered a suitable training to use the tools properly. This has proven important to establish a critical mass.

Connectivity is considered to be very important, reason why the organisation invested in the tool Connect.

2. What are the activities that define CoPs.

Both by scholars and by practitioners in organisations, the concept of 'Community of Practice' has been applied to various types of groups, while at the same time various concepts are used for similar phenomena. Common to in most CoPs we have studied or found in the literature are the following characteristics

1. Existing within the context of workorganisations
2. oriented to sharing knowledge and learning
3. In a common area called 'practice'
4. not being product oriented with a specific deadline
5. having a group identity
6. organisationally distributed (which practically always implies geographically distributed)

These characteristics identify CoP versus project teams, internet communities, vocational associations or wider collectivities of people.

In our research so far we find however that what is called 'communities' may vary on these core characteristics:

- ad 1 and 6: CoPs can be intra- or interorganisational
- ad 2: for some the knowledge sharing is the exclusive purpose, others may have other purposes such as individual learning, problem solving, providing innovative products, networking (for individual purposes or for forming coalitions when required) or having sociable meetings.
- Ad 3. The practice can be very narrow (e.g. building dykes) to very broad (e.g. civil engineering in general)
- Ad 4. Some CoPs at some stage function as a project team when they are working on a specific product
- Ad 5. The group identity can be strong or weak, partly related to size

Finally, CoPs appear to differ also in the following dimensions:

- *Boundary*: open or closed for new members
- *Formalisation of set-up*: informal, bottom up or top down formally initiated;
- *Formalisation of co-ordination*: appointed facilitator, co-ordinator, or emerging 'leaders'
- *Size*: from small to very large
- *Composition*: only experts or experts plus newcomers
- *Virtuality*: high (not meeting face to face) or low (meeting mainly face to face)
- *ICT support*: sophistication of ICT support low or high

Some of these characteristics go together, so we could cluster the communities we found in the literature and in our own research into four categories:

- a. The '*Daily practice community*', described by e.g. Lave and Wenger (1990) consisting of experienced workers and newcomers, often working in physical proximity; their communication is sometimes found in daily interaction, but often realised through meetings such as colloquia; examples can be found in the world of consultants, but also in groups of skilled workers such as repairmen.
- b. The '*Formal expert community*' (see e.g. Unilever and BP's 'formal networks'), a limited (10 to 30) group of geographically and organisationally dispersed experts, rather formally instituted as group with the purpose of exchanging and possibly developing knowledge in a certain domain; interaction may be via ICT, but is often mainly face-to-face.
- c. The '*Informal network community*' (see e.g. BP CoP's), an informal, freely accessible, group of people (from small to relatively large, e.g. 200), geographically and organisationally dispersed, exchanging ideas mainly through the ICT network.
- d. The '*Problem solving community*' (see e.g. Shell), consisting of all (geographically and organisationally dispersed) employees working in a certain area; through the ICT network they exchange questions and answers concerning the solution of certain practical problems.

The research has to show whether more categories can be found

3. Constraints & freedoms

In our research program we analyse a series of case studies of CoPs, in terms of the above mentioned and other dimensions, in order to find **conditions** under which communities flourish. Presently we use a research model for identifying the relevant issues, that is derived from group dynamics. According to this model success of groups can always be defined in terms of the three types of functions all group have, although in varying combinations (e.g. McGrath, 1984):

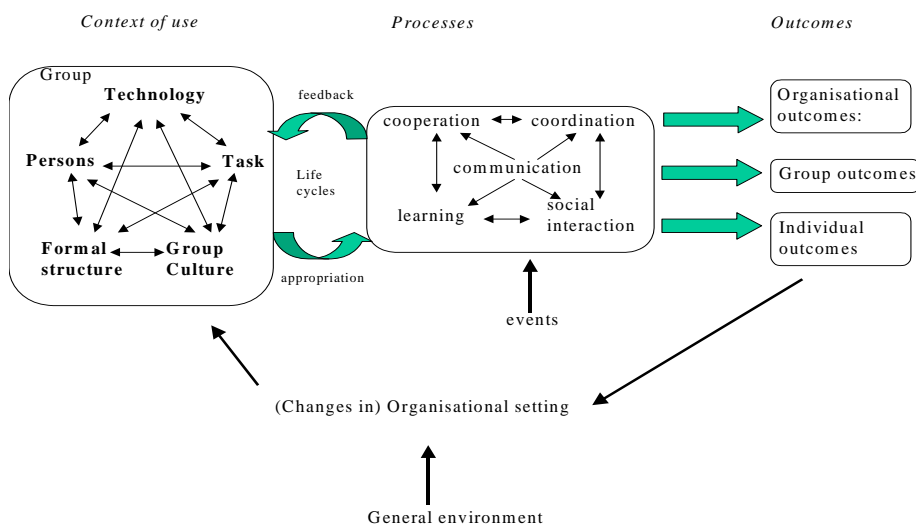
- the *production* (organisational) function: a group is successful to the extent that it contributes (through its output) to the effectiveness and innovation of the organisational context.
- the *group wellbeing* function: a group is successful to the extent that its activities contribute to its attractiveness and continuation;
- the *member support* function: a group is successful to the extent that membership is rewarding for the individual group members. Individual members are only motivated to co-operate in a group if they can find personal outcomes such as satisfaction, learning new experiences, payment, or feeling of belonging to the team.

According to this model the success of groups depends firstly on the way group members interact (i.e. communicate, co-operate, co-ordinate, exchange

knowledge and socialise), and secondly on certain characteristics of the setting, i.e. characteristics of the individuals, the group, the tools and the environment (see figure 1). These characteristics however are not static but can change continually, particularly in the early stages of a group. The interaction processes in a group change the context-characteristics of the group, thereby leading the group through certain 'life cycle stages'. In this dynamic perspective context characteristics such as the group task or trust and cohesion are both conditions for and output of group processes, depending on the moment of observation.

More precisely, the success of a group depends on the degree to which the processes mutually match to each other, and the degree to which the input characteristics match each other. This means e.g. that the formal structure should fit the goals of the community. Since the goals could be related to various outcomes, they may be difficult to reconcile: continuity of the community is probably served by strong formalisation and institutionalisation, while spontaneous knowledge sharing may be better served by weak formalisation. In the same way the processes may be inherently incompatible: strong co-ordination may be difficult to match with knowledge creation and learning processes.

Figure 1. Dynamic Group Interaction Model



The role of ICT. Adequate support by ICT is supposed to be one of the success-conditions for CoPs. However in practice this role seems to be quite ambiguous. Some CoPs seem to function very successful without (much) ICT. In accordance with a.o. Hansen (1999) we discern the *codification* and *personalization* strategies for managing knowledge. These strategies differ in the

way learning is promoted, i.e. through storing and finding knowledge in documents (codification) or through interaction between people to learn from each other (personalization). The choice of the strategy has implications for the kind of ICT-tools that should be available for a community. In the personalisation strategy, tools (i.e. certain applications of technology) have to support or at least not distort the five group processes that are presented in figure 1. Recently Wenger (2001) developed an approach that is in a sense comparable. He identified four polar dimensions to characterise the activities of groups and identified the way in which a multitude of ICT applications support these activities.

References

Andriessen, J.H.T.H., Soekijad, M., Huis in 't Veld, M. & Poot, J. (2001). *Dynamics of Knowledge Sharing Communities*. Report for the Telematica Instituut, Enschede.

Collison, C. (1999). Connecting the new organisation. How BP Amoco encourages post-merger collaboration, In: *Knowledge Management Review*, issue 7, March-April.

Hansen, M.T., Nohria, N. & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, march-april

Lave, J. & Wenger, E. (1991). *Situated Learning. Legitimate Peripheral Participation*. Cambridge: University Press.

Wenger, E. (2001). *Supporting communities of practice a survey of community-oriented technologies*. Shareware report on: <http://www.ewenger.com/tech>