

## COMMUNITIES OF PRACTICE AS A METHOD FOR KNOWLEDGE-ORIENTED COOPERATION<sup>1</sup>



Marco Bettoni,  
Research & Consulting  
Swiss Distance Learning University  
of Applied Sciences (FFHS)  
Postfach, Überlandstr. 12,  
3900 Brig  
Switzerland

E-mail: mбетtoni@fernfachhochschule.ch

### CO-AUTHORS

**Christoph Clases**, Solothurn University of Applied Sciences (FHSO), Riggengbachstrasse 16, CH - 4600 Olten, Switzerland, christoph.clases@fhso.ch

**Theo Wehner**, Center for Organizational and Work Sciences, Swiss Federal Institute of Technology Zürich, (ETH Zürich), Kreuzplatz 5, CH - 8032 Zürich, Switzerland, twehner@ethz.ch

### KEYWORDS

Communities of Practice, Participation, Human-oriented Knowledge Management, Knowledge Stewarding, Knowledge-oriented Cooperation.

### ABSTRACT

After a short historical review of the development of the concept of “Communities of Practice” (CoP) we present examples of organisational Knowledge Management (KM) in which Etienne Wenger's CoP model has been applied. In the main part we focus on the business orientated CoP framework that Wenger, Snyder and McDermott proposed in 2002 for KM by extending the original approach of 1998. Finally we conclude with a critical reflection over the necessity - within KM frameworks - to explicitly emphasize *participation in stewarding knowledge* as a condition for bridging the gap between knowledge and its management.

### 1. INTRODUCTION

How can the employee pawn her knowledge to her team or enterprise without doing harm to herself? This difficulty shows us that a vital gap exists between individual knowledge and organizational knowledge management (KM), a gap similar to that between freedom and politics (Rousseau 1762). Communities of Practice (CoP), as a method for knowledge-oriented cooperation (KOC), can help to bridge this gap especially because by them the requirement that people must be placed in the centre of KM could be realized.

In the last 15 years the “knowledge environment” of most teams and enterprises became increasingly more dynamic, products and processes more knowledge-intensive (Probst et al. 1997, 30) and it became clear „*that the person, the subject, the individual employee deserves again a more important role in the production process*” (Dick and Wehner 2002, 12).

In this context, dealing with tacit knowledge became an important challenge and this contributed to originate the discipline of knowledge management. Since then, the claim that the human being must be placed in the center of KM has been raised again and again, in the management literature however, „*up to now almost no means or*

---

<sup>1</sup> Contribution to TACONET Conference on Self-regulated Learning in Technology Enhanced Learning Environments, introductory talk of 23 September 2005, Lisbon, Portugal.

*even tools have been elaborated, for meeting this requirement*" (Clases and Wehner 2002, 46). Why? An important reason might lie in the reduction of the "human factor" to its individual dimension. Such a concept of a „one dimensional person" matches indeed the insight, that strictly speaking only individuals are able to produce knowledge (Nonaka and Takeuchi 1995, 59 and 239), leads, however, by overlooking the social dimension, to a contradiction with the conception of knowledge as socially mediated knowledge (Clases 2003): this contradiction prevents then the fulfilment of the mentioned claim. The great importance for KM of the concept of Communities of Practice lies in the opportunity of overcoming this contradiction because together with technological and organisational aspects now also human aspects - for example human factors (Bettoni and Schneider 2002), socialisation (Nonaka and Takeuchi 1995) and social capital (Lesser and Prusak 1999) - can be taken into account, both in their individual and social dimension.

## 2. HISTORICAL RETROSPECT

Communities of practice (CoP) were recognized relatively early from single researchers and organization consultants as a suitable unit of analysis for research in work organization (Jordan 1994) as well as excellent as "platforms for knowledge work" and therefore for successful knowledge management (Schmitz and Zucker 1996, 156ff). The CoP concept kept on, however, being unmentioned for the time being in the mainstream KM literature: for example two KM bestseller (Probst et al. 1997; North 1998) did not even outline the CoP approach.

Lave and Wenger had initially specified the CoP notion only intuitively as "*an intrinsic condition for the existence of knowledge*" (Lave and Wenger 1991, 98). Wenger further developed later the intuitive CoP term in a systematic, comprehensive manner (within the framework of his social theory of learning focused on participation, Wenger 1998b, 7) as a special kind of community in which practice served as source of inner cohesion and justified as follows the choice of the term (Wenger 1998b, 72): *„... collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise. It makes sense, therefore, to call these kinds of communities 'communities of practice'."* (Wenger 1998b, 45).

In the second half of the 90<sup>ies</sup> communities and networks were more and more recognized and used as valuable concepts for implementing new forms

of knowledge sharing (North et al. 2000; Schmidt 2000; Henschel 2001; Lesser and Storck 2001) and many organizations began to design their KM solutions as communities or as networks (Le Moutl 2001; Kok et al. 2003; Saint-Onge and Wallace 2003). They had intuitively recognized, that a big gap separates knowledge and KM as well as individuals and enterprises - because every person is inseparably bound to his or her tacit knowledge - and that communities and networks allow to bridge it.

## 3. COP EXAMPLES

Communities of practice which tried to implement Wenger's CoP model as an instrument of KM were built in many industrial and commercial organizations. Volkswagen promotes since 2003 so called "Job Families" which are company-wide competence communities (Schultz et al. 2003). Daimler Chrysler supports since 1997 so called "Tech Clubs" which are networks of engineers in car development (Wenger et al. 2002). At Airbus, British Petroleum, Cap Gemini Ernst and Young, Clarica, Eli Lilly, Ford, Hewlett Packard, IBM, McKinsey, Mercedes-Benz, Schlumberger, Shell Oil and the World Bank Wenger and his colleagues were involved in implementing different kinds of CoPs like helping communities, best practice communities or innovation communities (Wenger et al. 2002; Wenger and Benninger 2002). The Australian National Training Authority (ANTA) financed 16 CoPs within its national program for vocational education (Mitchell 2002). Siemens has a company-wide CoP for knowledge sharing among people working in implementing knowledge management initiatives (Enkel et al. 2000). Achmea (one of the 3 greatest insurance groups in Holland) has employee-networks for exploiting synergies between a great number of independent business units (Dignum and van Eeden 2003).

Wenger's CoP model was used also as an analytical instrument, however, only as a very coarse frame of reference so that essential parts (as for example "participation") remained mainly unconsidered. Arnold and Smith (2003) analyzed an Online Learning Community with regard to the interplay between context and technology; Ruuska and Vartiainen (2003) have identified social structures and used them as reference for analysing knowledge sharing; Osterlund and Carlile (2003) examine the knowledge sharing practice in complex organizations from a relational perspective on social realities; Stuckey et al. (2002) have investigated how to support teachers and doctors in the utilization of innovative ICT technologies; Smith and Coenders (2002) implemented and tested a feedback-instrument for an Online workshop;

finally Manca and Sarti (2002) deal with means for supporting virtual learning communities: they have analyzed their needs and derived functions of ICT systems which can satisfy those needs.

#### 4. THE EXTENDED COP MODEL AS A KM APPROACH

Wenger, in his social theory of learning published 1998 under the title "Communities of Practice" - up today the most comprehensive theoretical inquiry into the CoP topic - had focused on learning as social participation. 'Social participation' meant for him "not just participation to local events of engagement in certain activities with certain people" but "a more encompassing process" including (Wenger 1998b, 4):

- the active participation to the practices of social communities
- the construction of identities in relation to these communities
- the way in which life and the world are experienced as meaningful.

In the course of the application of this theory to the development of communities of practice for international companies and organizations it became however clear that cultivating a CoP was a very challenging task in face of which most managers seemed rather helpless. Wenger and his colleagues recognized that: *„...it is not particularly easy to build and sustain communities of practice or to integrate them with the rest of an organization“* (Wenger and Snyder 2000, 140) and that managers, since they were unable to deal with the social theory of learning, had to be supported with other means than theory for accomplishing the task of cultivating CoPs: *“The first step for managers now is to understand what these communities are and how they work. The second step is to realize that they are the hidden fountainhead of knowledge development and therefore the key to the challenge of the knowledge economy. The third step is to appreciate the paradox that these informal structures require specific managerial efforts to develop them and to integrate them into the organization so that their full power can be leveraged.* (Wenger and Snyder 2000, 145). This led to the development of a practical guide for the implementation of CoPs in organizations (Wenger et al. 2002); in this work the original, theoretical CoP concept of 1998 was extended with explicit references to Knowledge Management and became so a truly structured, application oriented KM approach.

The substantial theoretical innovations in relation to the theory from 1998 are (Bettoni et al., 2004):

- the concept of knowledge as an organisational challenge and the seven design principles
- the organisational learning loop within the knowledge system of the enterprise
- the structural CoP model
- a clarification of the CoP definition
- the five stages of development

All these innovations extend the original CoP concept to a complete model of a new organizational form and can thus be used as a method both for designing and sustaining a CoP as well as for the analysis of its structural aspects and development characteristics. They represent the main points, to which one should pay attention, when designing, developing and supporting communities of practice.

#### 4.1 The concept of knowledge and seven design principles

Understanding the concept of knowledge represents one of the main problem areas for the functioning of real knowledge communities (North et al. 2000, 56). Furthermore it determines the first 2 of 7 „deadly sins“ of KM (Schneider 2001). More than ever before, today in our “small planet” the task of stewarding knowledge individually or collectively, privately or in organisations, requires first of all the insight that knowledge is not a „thing“ that can be managed like other assets. In line with recent developments in knowledge theory (von Glasersfeld, 1995) the reasons for this view can be summarized in four key points about the essence of knowledge (Wenger et al. 2002, 8ff):

- Knowledge lives in the human act of knowing
- Knowledge is tacit as well as explicit
- Knowledge is social as well as individual
- Knowledge is dynamic

It is exactly this „interactive“ nature of knowledge which makes organisational and transorganisational knowledge management a challenge. Knowledge cannot be considered as material of enterprise processing (for example in order procedures or other business processes) but should be seen as a tacit resource intimately bound to the human being - as a „subjective model of reality“ (Dick and Wehner 2003, 14) - and to his social interactions as a socially oriented model of reality.

Given this knowledge challenge, how to design for sustainable knowledge interactions? The following principles focus on the insight, that CoPs are living entities and require an approach that acknowledges the importance of passion, relationships and voluntary activities in organizations (Wenger et al. 2002, 51ff):

- design for evolution

- open a dialogue between inside and outside perspectives
- invite different levels of participation
- develop both public and private community spaces
- focus on value
- combine familiarity and excitement
- create a rhythm for the interactions

#### 4.2 The organisational learning loop within the knowledge system of the enterprise

Every company, every organization has a knowledge system which, however, is rarely consciously perceived and systematically organized (Wenger et al. 2002, 166ff). Many knowledge resources remain thus unused. A knowledge system consists of two closely connected process groups:

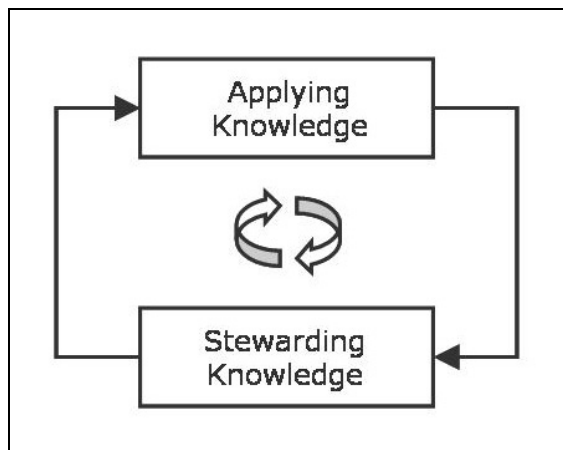


Figure 1: Organisational Knowledge System

a) *Stewarding knowledge* - This group encompasses processes like acquiring, developing, making transparent, sharing and preserving knowledge. They are used for handing down, reproducing and renewing knowledge and experience. What should be noticed here is that these processes are not considered at a cognitive but at a coordinative-cooperative level (see the cooperation model by Wehner et al. 1998): knowledge stewarding does not intervene therefore directly in individual cognitive processes as too easily alleged by certain critics of KM (Malik 2001).

b) *Applying knowledge* - This group collects what happens when knowledge resources are used, for example in business processes. In an enterprise an organisational learning loop is established, if employees of the formal organization (teams, departments) informally participate at the same time also in CoPs (Wenger et al. 2002, 18ff).

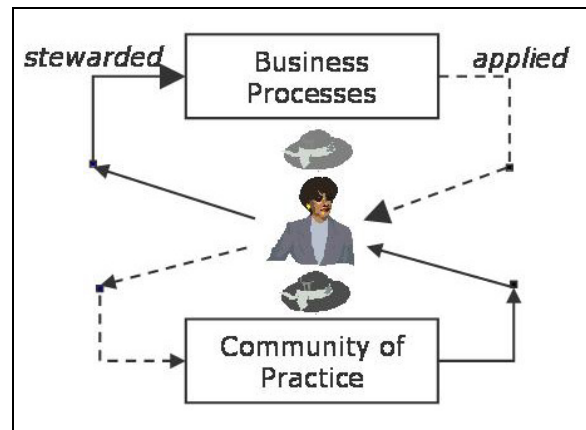


Figure 2: Experience and Knowledge Flow in the Organisational Learning Loop

This multiple membership creates a learning loop which has its focal point in the employee: she gains experiences in her daily work within business processes and can incorporate them in the CoP, where this knowledge is stewarded collectively and prepared for flowing back to the business processes from where it originated.

#### 4.3 The structural CoP model

A CoP consists of three fundamental elements or core design dimensions, that mutually influence each other and should be kept in balance (Wenger et al. 2002, 27ff): knowledge domain, community and practice:

- The *knowledge domain* is a collection of topics, key issues, problems and open points that CoP members commonly experience in their daily work and that are of great importance to them. It is an area of expertise that brings people together with passion, guides the questions they ask and the way they organize their knowledge and creates a sense of accountability to the development of a practice. CoP members can take responsibility to provide the organization the best knowledge and skills in the domain to which they are committed.

- The *community* consists of the personal and institutional relationships between the members and includes the members as persons, their ties, their interactions (regularity, frequency and rhythm), the atmosphere, the evolution of individual and collective identities and, last but not least, spaces (physical or virtual) for meeting together. This element is very important because it allows taking into account the social aspects of stewarding knowledge, applying it and learning together.

- The *practice* covers frameworks, standards, ideas, instruments, stories, experiences, lessons learned and documents that community members share. It

denotes a specific, collectively elaborated know how about ways of doing things in a specific domain.

These three elements form together an ideal knowledge structure as a social structure which can take over the responsibility for stewarding a specific domain of expertise in an organization.

#### 4.4 A clarification of the CoP definition

The three elements of the structural model facilitate a clarification of the definition of CoP through a clearer differentiation from other social structures. They represent also different aspects of participation and identity and can by that help understanding the motivation of the members. A CoP can be defined thus as a group or network of persons (Wenger et al. 2002, 4 and 40ff), that functions as an informal organisational structure, whose members participate voluntarily, based on collegial relationships not reporting relationships, share the interest and the passion in a knowledge domain, develop as persons by mutual relationships which are grounded in the collective stewarding of a knowledge domain and apply the results in their daily job. All the members come together from different hierarchical and functional fields of the organization attracted by "self identification" and form an „open and organically developing group of persons“ (Lakoni at al. 2001, 81).

#### 4.5 The five stages of development

Features for the analysis and design of a CoP can be identified also from structuring its evolution into distinguishable moments (phases or stages). The life-cycle of a CoP can be subdivided into 5 stages (Wenger 1998a, 3; Wenger et al. 2002, 68ff): potential, coalescing, maturing, stewardship, transformation. In the course of this evolution the features to be developed change; hence also the related management challenges and activities must be accordingly modified.

*Potential:* in the first stage the CoP does not exist at all or it is only a weak network of persons that are facing similar problems and tasks but meet only rarely; although the potential members already carry in themselves the potential for the development of stronger relationships, a CoP would probably hardly arise spontaneously. For this purpose you need explicit planning and launch activities. Many authors restrict the CoP concept to spontaneously arisen, informal networks: Wenger has however explicitly denied this restriction (Wolf 2003a): from his experience it does not matter how the community started (spontaneously or at the instigation of management), in both cases they

require engagement on the part of people and some kind of sponsorship from the management. In the potential stage the main task consists in planning the CoP: determining the knowledge domain and its scope, finding persons that are already connected in the chosen field, identifying common needs for knowledge and skills.

*Coalescing:* In the second stage the members should be supported in building relationships by a suitable interaction model. The main task consists here in ‚nurturing‘ the CoP: determining the value that sharing knowledge in the chosen field has for the members and for the organization, building trust and personal relationships between the members, for example by promoting mutual understanding, discovering the kind of knowledge whose sharing would be most useful and determining suitable ways of sharing. In this stage of incubation the great challenge for the CoP consists in balancing two opposite demands: „*the need to let its members develop relationship and trust against the early need to demonstrate the value of the community*“ (Wenger et al. 2002, 83).

*Maturing:* This stage is characterized by an increase of the mutual engagement and a higher dynamics. The CoP deals particularly with the clarification of its primary intentions, its role in the organization as well as its boundaries. The members feel more and more the need to organize the knowledge of the community, the core group identifies gaps in the knowledge of the CoP and seeks opportunities to focus on that systematically, for example through the development of a "knowledge repository". The number of members can rapidly increase in this stage and introduce new impulses but also thwart the plans of the core group. The challenge consists in resolving the tension between growth and internal focus: for this purpose the CoP must both preserve the existing trust in spite of its growth as well as further develop spontaneous mutual help in spite of systematization.

*Stewardship:* In this stage the CoP continues its work for the systematic organization of the common body of knowledge: expertise and personal relationships are extended and deepened, tools and instruments are further developed. The CoP feels pride now for its own achievements, it sees itself as an owner of the knowledge domain it is in charge of and is conscious of its own identity and voice in the organization. In order to maintain the relevance of its knowledge field, however, the CoP needs also openness for new ideas, approaches and relationships: „*A community needs to balance its sense of ownership with receptivity to new people and ideas*“ (Wenger et al. 2002, 105). This

openness must be, however, more than only a willingness to accept new members: it requires the active search for new ideas, new members and renewal in the leadership.

*Transformation:* The end of a CoP can have very different causes: technological evolutions can make become obsolete the knowledge domain, structural modifications can let disappear the benefit for the organization or the interests of the members can progressively diverge. As a result of such events the attractivity of the CoP and the influx at new topics can be reduced, the community progressively loses members and reduces its activities more and more until nobody shows up to the community events. A CoP can also merge with another, split into several smaller CoPs or be institutionalized as a department. Whatever the transformation will be, the heritage of the CoP will live on in the experiences of its members and increase the ability of the organization to build up further communities of practice.

## **5. PARTICIPATION AND KNOWLEDGE MANAGEMENT**

Although it seems to be obvious that „*in a knowledge organization participation is no more merely a normative postulate, but necessary and natural*” (Dick and Wehner 2002, 18) and although social participation plays a central role in the theory of Wenger (1998), in the extended CoP approach Wenger et al. (2002) have not directly addressed participation in the social practice of the community except for two places: a short consideration of the structural elements as aspects of participation and the explanation of the third design principle (Wenger et al. 2002, 44-45 and 55-58). Besides this, the term „participation” is not mentioned at all, so for example in connection with the discussion of internal leadership tasks, what is especially amazing here if one considers, that all

members of the CoP should in principle contribute to the different leading roles (coordination, facilitation, domain stewarding and so forth) or be internally trained for that. Wenger et al. (2002) defend also with respect to CoP-leadership a very participatory approach, however without referring to it explicitly. Why this discrepancy between the theory of 1998 and their later extension in the work of 2002 in the consideration and exposition of participation? A reason is probably that participation is so to speak “integrated” in the extended approach so that it would not have to be mentioned - in the ideal case - explicitly. The problem in this case is, however, that an important element remains hidden so that faulty interpretations - in which participation remains unconsidered - become more probable.

However, without taking seriously social participation the crucial questions of KM (Dick and Wehner 2002, 18) can hardly or only unsatisfactorily be answered and a community of practice can hardly be successful. Wenger presented the reasons for that in his main work from 1998. Shortly: participation as „*social experience of living in the world in terms of membership in social communities*” (Wenger 1998b, 55) forms a unit with reification as “*process of giving form to our experience by producing objects that congeal this experience into ‘thingness’*” (Wenger 1998b, 58). Unit means that the two processes can not be considered isolatedly, that one can not be understood without the other one, that only in co-ordination they can generate meaning. Hence the ‘*conditio sine qua non*’ for having communities of practice become a reliable way to a human oriented knowledge management lies in taking seriously *legitimate participation in stewarding knowledge*: this is necessary for cultivating them successfully and succeeding in bridging the gap that separates knowledge and knowledge management.

## REFERENCES

- AACE 2002. Proc. of the World Conf. on E-Learning in Corporate, Government, Healthcare and Higher Education (E-Learn 2002 CD-Rom). Montreal: October 15-19, [www.aace.org](http://www.aace.org).
- Arnold, P. and Smith, J.D. 2003. Adding connectivity and losing context with ICT: Contrasting learning situations from a community of practice perspective. In Huysman, M., Wenger, E. and Wulf, V. (2003), 465-484.
- Bettoni, M., Clases, C. and Wehner, T. 2004. Initiierung, Einführung, Evaluation von Communities of Practice. In: Reinmann, G. and Mandl, H. (eds.) *Psychologie des Wissensmanagement*, Göttingen: Hogrefe.
- Bettoni, M. and Schneider, S. 2002. Experience Management - Lessons Learned from Knowledge Engineering. In Minor, M. and Staab, S., 2002, 117-128.
- Clases, C. (2003). Eine arbeitspsychologische Perspektive auf soziale Dynamiken kooperativer Wissensproduktion. In Franz H. W., Howaldt, J., Jacobsen, H. and Kopp, R. (Hrsg.): *Forschen - Lernen - Beraten. Der Wandel von Wissensproduktion und -transfer in den Sozialwissenschaften*. Berlin: sigma.
- Clases, C. and Wehner, T. 2002. Handlungsfelder im Wissensmanagement. In Lüthy, W., Voit, E. and Wehner, T. (2002) 39-56.
- Dick, M., and Wehner, T. 2002. Wissensmanagement zur Einführung: Bedeutung, Definition, Konzepte. In Lüthy, W., Voit, E. and Wehner, T. (2002) 7-28.
- Dignum, V., van Eeden, P. 2003. Seducing, engaging and supporting communities at Achmea. In Proc. of the Fourth European Conf. on Knowledge Management, Oxford, 18-19 Sept., 253-262.
- Huysman, M., Wenger, E. and Wulf, V. 2003. Communities and Technologies. Proc. 1st Int. Conf. on Communities and Technologies. Dordrecht: Kluwer.
- Jordan, B. 1994. Ethnographic Workplace Studies and Computer Supported Cooperative Work. IRL Report No. IRL94-0026. In Shapiro, D. et al., 1996.
- Kok, G., Jongedijk, S. and Troost, J. 2003. Insights from KPMG's European Knowledge Management Survey 2002/2003. KPMG Knowledge Advisory Services, Netherland. <http://www.kpmg.nl/kas>.
- Lakoni, S., Schwämmle, U. and Thiel, M. 2001. Zwischen Chat-room und Kantine. Wie "Communities of Practice" zu Innovation und Veränderung beitragen. *profile* (2), 74-84.
- Lave, J. and Wenger, E. 1991. *Situated Learning. Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Le Moul, D. 2001. How to make a CoP fly. KnowledgeBoard, 6.12.2002.
- Lesser, E., and Prusak, L. 1999. Communities of Practice, Social Capital and Organisational Knowledge. White Paper, IBM Institute for Knowledge Management, <http://ikm.ihost.com>.
- Lesser, E. L., and Storck, J. 2001. Communities of practice and organizational performance. *IBM SYSTEMS JOURNAL*, 40 (4), 831-841.
- Lüthy, W., Voit, E. and Wehner, T. 2002. *Wissensmanagement - Praxis. Einführung, Handlungsfelder und Fallbeispiele*. Zürich: vdf.
- Malik, F. 2001. Wie Kopfarbeiter gemanagt werden. *Basler Zeitung*, 16.07.2001, Ressort: Wirtschaft, Rubrik „Der BaZ-Gast“, (163), 14.
- Manca, S. and Sarti, L., 2002. Comunità virtuali per l'apprendimento e nuove tecnologie. *Tecnologie Didattiche*, 25 (1), 11-19.
- Minor, M. and Staab, S. 2002. 1-st German Workshop on Experience Management. *Lecture Notes in Informatics (LNI) Vol P-10*. Bonn: Gesellsch. für Informatik (GI).
- Mitchell, J. 2002. The Potential of Communities of Practice to underpin the National Training Framework. Melbourne: ANTA.
- Nonaka, I and Takeuchi, H. 1995. *The Knowledge-Creating Company*. Oxford: Oxford Univ. Press.
- North, K., 1998. *Wissensorientierte Unternehmensführung. Wertschöpfung durch Wissen*. Wiesbaden: Gabler.
- North, K., Romhardt, K. and Probst, G. 2000. *Wissensgemeinschaften. Keimzellen lebendigen Wissensmanagement. io management*, (7/8), 52-62.
- Osterlund, C. and Carlile, P. 2003. How Practice Matters: A Relational View of Knowledge Sharing. In Huysman, M., Wenger, E. and Wulf, V. (2003) 1-22.
- Probst, G., Raub, S. and Romhardt, K. 1997. *Wissen managen. Wie Unternehmen ihre wertvollste Ressource optimal nutzen*. Zürich: Verlag NZZ.
- Rousseau, J.J. 1762. *Du contrat social*. In: *Oeuvres Complètes, III*. Paris: Gallimard, 1964.
- Ruuska, I. and Vartiainen, M. 2003. Communities and other Social Structures for Knowledge Sharing. A Case Study in an Internet Consultancy Company. In Huysman, M., Wenger, E. and Wulf, V. 163-183.
- Saint-Onge, H. and Wallace, D. 2003. *Leveraging Communities of Practice for Strategic Advantage* Boston: Butterworth-Heinemann.
- Schmitz, C. and Zucker, B., 1996. *Wissen gewinnt. Knowledge Flow Management*. Düsseldorf: Metropolitan.
- Schneider, U. 2001. *Die 7 Todsünden im Wissensmanagement*. Frankfurt a/M: FAZ
- Schultz, F. and Pucher, H.F. 2003. *www.deck - Wissensmanagement bei Volkswagen*. *Industrie Management*, 19 (3), 64-66.
- Shapiro, D., Tauber, M. and Traunmüller R. (Eds.) 1996. *The Design of Computer Supported Cooperative Work and Groupware Systems*. Amsterdam: North Holland / Elsevier Science.
- Smith, J.D. and Coenders, M. 2002. E-feedback to reflect legitimate peripheral participation. In AACE, 2002.
- Spieß, E. 1998. *Formen der Kooperation*. Göttingen: Verlag für Angewandte Psychologie.
- Stuckey, B., Buehring, A. and Fraser, S. 2002. Communities of Practice and On-Line Support for Dissemination and Implementation of Innovation. In AACE, 2002.

- von Glasersfeld, E. 1995. *Radical Constructivism. A Way of Knowing and Learning*. London: Falmer Press.
- Wehner, T., Clases, C., Endres, E. and Raeithel, A. 1998. Zwischenbetriebliche Kooperation. Zusammenarbeit als Ereignis und Prozess. In E. Spiess (Hrsg.), *Formen der Kooperation* (95-124). Göttingen: Verlag für Angewandte Psychologie.
- Wenger, E. 1998a. Communities of Practice: Learning as a Social System. *Systems Thinker*, June 1998, 1-10.
- Wenger, E. 1998b. *Communities of Practice: Learning, Meaning, Identity*. Cambridge: Cambridge Univ. Press.
- Wenger, E., Benninger, M.L. et al. 2002. Communities of Practice for Improved Learning Systems in the Corporate, Government, Higher Education and Health Care Sectors. In *AACE*, 2002.
- Wenger, E., McDermott, R. and Snyder, W. 2002. *Cultivating Communities of Practice: A Guide to Managing Knowledge*. Boston: Harvard Business School Press.
- Wenger, E., and Snyder, W. 2000. Communities of Practice: The Organisational Frontier. *Harvard Business Review*, 78, (1), 139-145.
- Wolf, P. 2003a. Interview with Etienne Wenger on Communities of Practice. Knowledge-Board, 3.11.2003, [www.knowledgeboard.com](http://www.knowledgeboard.com).
- Wolf, P. 2003b. *Erfolgsmessung der Einführung von Wissensmanagement*. Münster: Monsenstein und Vannerdat.

## **AUTHOR BIOGRAPHY**

**MARCO BETTONI**, born in Legnano (Italy) in 1952. Since September 2005 Director of Research & Consulting at the Swiss Distance University of Applied Sciences ([www.fernfachhochschule.ch](http://www.fernfachhochschule.ch)). Master degree in mechanical engineering in 1977 (ETH Zürich), worked until 1987 for industrial (Rieter, Siemens), banking (UBS) and academic (ETH) organizations in the domains of machine design, engineering education, IT management and IT development. From 1987 to 1991 project leader and knowledge engineer in the development of knowledge-based systems; cognitive science foundations research since 1981. Between 1991 and 2004 Professor for Knowledge Technologies at the Basel University of Applied Sciences (FHBB). Main domain of competence: Knowledge Technologies (Artificial Intelligence, especially Knowledge Engineering) and Knowledge Management, human aspects and Knowledge Cooperation. From June 2003 to August 2005 'guest researcher' in individual and social aspects of Knowledge Management at ETH Zürich (<http://www.zoa.ethz.ch>)