

Organizing Future: An Integrated Framework for the Emergence of Collective Self-transcending Knowledge

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von **Diplom-Kauffrau Birgit Feldhusen**

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Meinen Eltern und meinen Nichten

Den Wurzeln und der Zukunft

Dank

Seit ich als Kind anfang zu denken beschäftigt mich die Frage, ob und wie es gelingen kann, das Leben zu begreifen und wahres Wissen und Weisheit zu erlangen. Was in Menschen und zwischen Menschen geschieht, wie sie ihr Leben und ihre Zukunft gestalten können waren seit jeher zentrale Themen meiner Gedankenwelt. Während der Jahre musste ich (zunächst mit Bedauern) feststellen, dass jede vermeintliche Antwort neue Fragen schafft. Doch genau dieser Kampf mit der Hydra hält das wohlige Feuer des ‚Wissen wollen‘ am Leben.

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Abstract

Within dynamic 21st century knowledge economies, future-building knowledge, that bears capacities to transcend existing boundaries and create something new, is of particular importance. Within the first decade of the new century, new concepts such as ‘learning from the future’ or ‘self-transcending knowledge’ developed within knowledge management. So far, they lacked a theoretical grounding in relevant learning theory as well as a sound acknowledgement and consideration of such knowledge structures’ emergence and social embeddedness. Thus, key principles and leverage factors for designing respective knowledge processes were difficult to derive.

This dissertation investigates theoretical ground that can provide a basis to explain the creation of future-building knowledge in collective structures. It is guided by the following research question: ‘How can the emergence of self-transcending knowledge in collective organizational settings be rooted in theories of knowledge, learning and cognition?’

Starting from the model of knowledge-based management, the model is expanded by exploring cognitive, creative and social systemic aspects of knowledge creation on a transdisciplinary basis. Research draws on constructivist learning theory, complexity-based approaches in knowledge management and organizational learning, recent accounts in cognitive science (enaction/embodiment) and a creative logic of emergence to derive an integrated model for collective self-transcending knowledge.

The model contributes to the integration of knowledge management, organizational learning and cognitive science, expanding knowledge-based management towards attention-based management. The model’s three dimensions and three domains form an integrated theoretical basis to derive key principles and leverage factors for steering future-building knowledge processes. Simultaneously, they reveal leverage factors’ limited – i.e. enabling, not determining - impact on processes of ‘organizing future’.

Kurzfassung

In dynamischen Wissensgesellschaften des 21. Jahrhunderts kommt zukunfts- und potentialorientierten Formen des Wissens eine besondere Bedeutung zu. In der ersten Dekade des neuen Jahrhunderts entstanden im Wissensmanagement neue Konzepte eines ‚Lernens aus der Zukunft‘ und eines ‚transzendierenden Wissens‘ – Wissen, das ermöglicht, über Bestehendes hinauszuwachsen und Neues entstehen zu lassen. Bisher fehlten jedoch eine theoretische Unterfütterung mit relevanten Ansätzen der Lerntheorie sowie die fundierte Berücksichtigung der Emergenz und sozialen Einbettung von derartigen Wissensstrukturen. Eine Ableitung von Steuerungsprinzipien war demzufolge nur schwer möglich.

In dieser Dissertation werden theoretische Grundlagen erforscht, die die Generierung von zukunftsorientiertem Wissen in kollektiven Strukturen erklären können. Geleitet wird die Forschung von der Frage „Wie kann die Emergenz von transzendierendem Wissen in kollektiven, organisationalen Strukturen in Theorien des Wissens, Lernens und der Kognition verankert werden?“

Ausgehend vom Modell des wissensbasierten Managements werden erweiternde kognitive, kreative und sozial-systemische Aspekte der Wissensgenerierung transdisziplinär erforscht. Konstruktivistische Lerntheorien, komplexitätsbasierte Ansätze aus Wissensmanagement und Organisationalem Lernen, neuere Ansätze der Kognitionswissenschaft (Enaction/Embodiment) sowie kreativ-logische Ansätze zu Emergenz werden herangezogen, um ein integriertes Modell für kollektives transzendierendes Wissen abzuleiten.

Das Modell leistet einen Beitrag zur Integration von Wissensmanagement, Organisationalem Lernen und Kognitionswissenschaft und erweitert auf dieser Grundlage das wissensbasierte Management in Richtung eines aufmerksamkeitsbasierten Managements. Die drei Dimensionen und drei Domänen des Modells schaffen eine integrierte theoretische Basis, mit deren Hilfe Steuerungsmöglichkeiten für zukunftsorientierte Wissensprozesse abgeleitet werden können. Gleichzeitig lassen sie deren begrenzten - d.h. lediglich ermöglichenden, nicht determinierenden - Einfluss auf das ‚Organisieren von Zukunft‘ erkennen.

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1 Introduction

During the last 20 years, knowledge and the capability to create and utilize such knowledge has been acknowledged as the most important source of a company's sustainable competitive advantage which gave rise to the discipline of knowledge management. Early concepts of knowledge management were based on a static, objective notion of knowledge, therefore limited to disciplines around knowledge accumulation, sharing and storage. But, since end of the 90ies, there have come up approaches of knowledge-based management that embrace a dynamic, subjective notion of knowledge, therefore focus on the dynamic human processes of knowledge creation and their alignment with sensing and seizing future possibilities as underlying source of competitive advantage.

Within this context, only recently, there have emerged new concepts of **future-building knowledge** such as potential knowledge or self-transcending knowledge. These specific kinds of knowledge seem to elude from being manageable in terms of causal action-impact-relation but rather seem to follow the principle of enabling. Questions are raised on how to design enabling environments that facilitate these kinds of knowledge to emerge. There is a noticeable trend in looking for answers within a community view of knowledge in order to tackle the social embeddedness of knowledge. The complex nature of questions around self-transcending knowledge raises requests for transdisciplinary research accounting for related and adjacent disciplines of knowledge management.

The aim of this dissertation is to develop a transdisciplinary theoretical model for the concept of self-transcending knowledge in collective organizational settings in order to identify leverage factors for the provision of required knowledge infrastructures that enable emergence of this collective self-transcending knowledge. In approaching this aim, the dissertation goes beyond the boundaries of a strict knowledge management focus. It integrates insights from organizational learning, complexity theory and cognitive science to bring in aspects of social, creative and cognitive processes.

1.1 Relevance of Collective Self-transcending Knowledge

New Realities in Management

Business environment in the 21st century is more volatile than ever as pace of change accelerates, competitive ‘anarchy’ is on the rise, integration in webs and systems leave companies with less and less control over their own destinies, information and ideas want to be free and strategy life cycles are shrinking. For Gary Hamel, number one on Wall Street Journal’s 2008 ranking of most influential business thinkers, these new realities call for new organizational and managerial capabilities. The most important question for any company in the new century is: Are we changing as fast as the world around us? (Hamel & Breen 2007, pp.9–11)

Management is a mature technology that must now be reinvented for a new age. With this in mind, a group of scholars and business leaders from Harvard University, MIT, Berkeley University, London Business School, McKinsey and others, assembled in May 2008 to lay out a road map for reinventing management. (Hamel 2009, p.91) Outcome was a list of 25 Management’s Grand Challenges marking a management revolution necessary to be able to tackle the future world. Number one on this list is to ensure that management serves a higher purpose instead of maximizing shareholder’s wealth. Further on the list and most relevant to the motivation of this research are the imperatives to “Reinvent strategy making as an emergent process” (no 9) and to “Further unleash human imagination” (no 21). In the future, top management won’t make strategy but will work to create the conditions in which new strategies can emerge and evolve. “Knowledge about what engenders human creativity must be better applied in the design of management systems.” (Hamel 2009, pp.93–94)

Theories and practices of organizational learning have shown paths into this direction and led the first steps. However, the idea of organizational learning is still in the process of being innovated. In order to build organizations where people continually expand their capacity to create the results they truly desire and collective aspiration is set free, the idea of a world made of separate, unrelated forces must be replaced by the idea of a highly complex world where the increasing complexity of its systems need to be managed. (Senge 1990, p.3) At present, management still does not have the tools to build and shape such complex

ecosystems where value creation transcends the firm's boundaries. Management need to be 'retooled' for an open world. (Hamel 2009, p.95)

Already in 1997, Allee (1997) recognized a beginning enlargement of the boundaries of human thinking as a result of the knowledge-driven society. He contrasted traditional and new thinking as shown in table 1.1 below. Within the new thinking change is all there is. Thus, management means insightful participation. All employees are lifelong learners and are motivated by their own creativity. Knowledge is collective and life is organized by cooperative, emergent organization principles.

However, Allee stresses that expanding the area of thinking doesn't mean the total replacement of the old way of understanding with a new one. The knowledge from traditional way of thinking cannot be obsolete or irrelevant. As both ways of thinking are valuable Allee proposes to integrate them so that both are transformed. (Allee 1997, p.5)

<i>Assumption</i>	Traditional Thinking	New Thinking
Scientific Foundation	Newtonian physics	Quantum physics
Time is ...	monochronic - one thing at a time	polychronic - many things at once
We understand by ...	dissecting into parts	seeing in terms of the whole
Information is ...	ultimately knowable	infinite and unbounded
Growth is ...	linear, managed	organic, chaotic
Managing means ...	control, predictability	insight and participation
Workers are ...	specialized, segmented	multi-faceted, always learning
Motivation is from ...	external forces and influence	intrinsic creativity
Knowledge is ...	individual	collective
Organiztaion is ...	by design	emergent
Life thrives on ...	competition	cooperation
Change is ...	something to worry	all there is

Tab. 1.1: Traditional Thinking versus New Thinking (Allee 1997, p.5)

Advanced Notion of Knowledge

Sociologist and economist Nico Stehr highlights the prominence of knowledge in today's societies: Knowledge is "no longer simply a means of accessing, of unlocking, the world's secrets but itself represents a world in the process of coming into being" (Stehr 2001, p.90). Knowledge is not just a constitutive feature of our modern economy but a basic

organizational principle of human activity - we organize our reality based on the knowledge we possess. Thus, Stehr defines knowledge as '**capacity to act**', as potential to 'start something going'. Knowledge which more than any other creates new opportunities for action will be privileged. (Stehr 2001, pp.89–90) As realization of such knowledge is dependent on specific social conditions, knowledge is linked with social power which controls relevant conditions and circumstances. (Stehr 1996, pp.7–8)

Peschl concludes that in a knowledge-based society which strongly focuses on knowledge and knowledge processes, the role of the individual, of his/her knowledge and of his personality has become more important: "the more the focus is on highly sophisticated knowledge, deep understanding, complex contexts, creative minds, profound change etc., the less it is possible to simply replace the person or automate his/her particular cognitive and personal faculties." (Peschl 2007b, p.137)

A certain kind of knowledge which especially implies the potential to 'start something going' is **future-building knowledge**, i.e. knowledge that refers to potentials and future developments that transcends existing boundaries, limited perspectives and self-centered thinking. Sensing and seizing future possibilities will distinguish great entrepreneurial leaders from the rest and determine competitive advantage in a complex, innovative knowledge economy. (Jaworski & Scharmer 2000, p.2,39). The step to realize this potential is to create a point of view about the future by imagining an array of markets around core competencies. Hamel refers to this as 'corporate imagination', 'fast forward thinking' or 'hindsight in advance' (Hamel 1993, pp.153–154) 'Imaginative companies' use imagination to envision markets that do not yet exist. (Hamel & Prahalad 1991, p.81) Organizations exist not only in actuality, but also in potentiality, however, attempts in theorizing organization still lack a corresponding focus on potentiality. (Nonaka et al. 2006, p.1197)

It seems to be essential for companies and organizations to be able to activate this specific kind of future-building knowledge which is referred to as **phronesis** by Nonaka (2007), as specific knowledge, creativity and **practical wisdom** by Teece (2009), as emergent, **potential knowledge** by Smedlund (2008), as pre-theoretical, **pre-propositional field** by Gueldenberg & Helting (2007) or as **self-transcending knowledge** by Scharmer (2001).

Scharmer's approach for sensing and seizing the future, thus, for achieving competitive advantage, is to tap into the sources of self-transcending knowledge which he introduces as

a third kind of knowledge besides the established concepts of objective explicit knowledge and subjective tacit knowledge. He defines it as tacit knowledge prior to its embodiment that describes the ability to sense and see the emerging opportunities before they become manifest in the marketplace (Scharmer 2001, p.137).

For knowledge management thinker Nonaka, knowledge is about enacting the reality it refers to. Knowledge is seen as tacitly or explicitly embodied in situated practice, being increased when externalized and shared by interaction in a spiraling process, guided by a future vision and driven by phronetic leadership (see chapter 2.2). For Scharmer, this guidance and drive of the knowledge spiral is a knowledge process itself organizing around self-transcending knowledge which is situated in an incipient, not-yet-enacted reality (Scharmer 2001, p.141).

Power of Collectives

There is a recognized necessity to understand how to access self-transcending knowledge especially on a collective level. While certain individuals in an organization may have the necessary cognitive and creative skills to generate self-transcending knowledge, the more desirable approach is to embed related processes inside the organization itself. An enterprise will be vulnerable if the sensing, creative, and learning functions are left to the cognitive traits of a few individuals (Teece 2009, p.12).

Meta-level knowledge that introduces a completely new dynamic into knowledge creation as it may bring up completely unexpected results and new perspectives, is especially powerful when accessed and performed in a collective setting (Peschl 2010, p.22). Similarly to Stehr's view on the link between knowledge and social power, Peschl highlights that knowledge and its meaning are the result of **social negotiations** (Risku & Peschl 2010, p.8) He proposes that, in the knowledge economy, knowledge creation need to be seen within a socio-epistemic context. We need to deeply understand conditions enabling and facilitating processes of (joint) understanding, knowledge (co-)construction and knowledge (co-)creation (Peschl 2010, p.22).

Jakubik (2007) notices a need and a trend in knowledge management research to shift the focus toward the community view of knowledge and **social embeddedness of knowledge**.

She recommends switching to a '**connectionists epistemology**' where knowledge does not reside in each individual's brain but rather in a system of interconnected people. As the literature does not quite explain how knowledge is created in communities, research in this area could provide opportunities for new contributions (Jakubik 2007, p.17).

Nonaka also sees that major research opportunities in the intersection between social practices and organizational knowledge creation and distills it into a new broad research question: "What is the relationship between organizational knowledge creation and social practices in organizations?" (Nonaka & von Krogh 2009, p.647)

Raza et al. (2007) go even further and shift the focus from the group and organizational level onto a global level: "The socially networked economy as well as society constitutes the emerging form of a global mind. This knowledge driven global mind thrives on more and more diverse sources of knowledge. It thrives on multiplicity of worldviews, values, beliefs. This is the very essence of emergent global existence of humanity. [...] The real task of the knowledge communities [...] is to transform the world to be a more harmonious place [...] to a new level of global human consciousness [...]" (Raza et al. 2007, p.51)

Possibly having this in mind, Scharmer suggests that the key to addressing the multiple crises of our time and future human developments lies in learning how to access the source of self-transcending knowledge and creative mastery collectively. But, ways to develop the capacity to develop higher collective knowledge across diverse settings and involving diverse organizations and actors, especially in the context of confronting multi-sector, multi-stakeholder challenges, are largely missing. (Scharmer 2007b, pp.xi, xvii) Experiencing a profound shift in individual thought conditions and attention fields is the rather easy part. The difficult part is to perform this shift in the context of groups and organizations: "How can we as a group shift our attention field so that we connect to our best future potential instead of continuing to operate from the experiences of our past?" (Scharmer 2007b, p.49)

Building Meta-competence

In the knowledge economy, knowledge has advanced to be the most important resource and has been recognized as a dynamic and subjective factor. Value is created and competitive advantage is gained not by mere knowledge accumulation but rather by collectively

- sensing, shaping and seizing opportunities through specific knowledge, creative activity and practical wisdom (Teece's approach of dynamic capabilities, chapter 2.1.2)
- acting to realize a self-transcending knowledge vision through correct and timely decisions and actions for the common good (Nonaka's approach of phronetic leadership, chapter 2.1.3)
- perceiving the most attractive & compelling version of the future at the moment it emerges and act on it instantly and appropriately (Scharmer's approach of self-transcending knowledge through learning from the future, chapters 2.1.4, 3.2.4)

Employing Nonaka's concept of 'ba' (chapter 2.2.3), which is described as "a continuously created generative mechanism that explains the potentialities and tendencies that either hinder or stimulate knowledge creating activities" (Nonaka & Toyama 2003, p.6), it can be concluded that there is obviously a necessity to understand how to create a 'ba' for self-transcending knowledge on a collective level.

According to the Oxford English Dictionary, the notion 'meta' means to be connected with a change of position or state, higher, beyond. Meta-knowledge is therefore knowledge associated with a change of state (Faucher et al. 2008). Such a change of state is essential within emerging business approaches as listed above, especially within the concept of self-transcending knowledge and its related concepts. Moreover, self-transcending knowledge itself can be thought of as a form of meta-knowledge. The capacity to activate this meta-knowledge on a system level and to design an enabling framework for the emergence of this collective creative process therefore builds an essential meta-competence for knowledge management and resulting competitive advantage.

After focusing on storage of explicit knowledge, then on the interplay between explicit and tacit knowledge, Scharmer sees it as the '**third phase of knowledge management**' (Scharmer 2001, p.139) to focus on self-transcending knowledge and the (thought) conditions that allow processes and tacit knowledge to evolve in the first place. Managers' ability to improve their quality of thought and their deep perception of customers will be the next basis for competitive advantage. (Scharmer 2007b, p.63)

1.2 Research Gap, Research Question, Contribution of Research

Research Gap

As this '3rd phase' view on knowledge management has only recently started to evolve, there has been only few scientific work around self-transcending knowledge and its theoretical underpinning so far, especially on collective level.

- Scharmer offers a method for accessing self-transcending knowledge which he calls 'presencing' (Scharmer 2000b). It signifies a heightened state of attention that allows individuals and groups to 'learn from the future', i.e. to operate from a future space of possibility, in which they drop the non-essential aspects of the self and open themselves to new aspects of their highest possible future self (Scharmer 2007b, p.1,7). But, Scharmer did not deliver a theoretical basis which could be used to explore enabling infrastructures for this heightened state of attention on collective level.
- Working on regional collective learning processes, Uotila and Melkas integrated self-transcending knowledge into Nonaka's SECI-model of knowledge creation. Yet, they confined themselves to adding two new modes of knowledge conversion: self-transcending knowledge into tacit knowledge (visualization) and vice versa (potentialization) (Uotila & Melkas 2008, p.229). Yet, any possibilities of direct access to the field of self-transcending knowledge have been neglected. They confirm that research on best practices in facilitating these processes is still non-existent. Exploring methods of futures research in facilitating the future-building knowledge conversion phases is considered to be fruitful (Uotila & Melkas 2008, p.230).
- Nonaka and Toyama (2007) as well as Nonaka and Takeuchi (2011) provide six principles of leadership for establishing future-building, phronetic leadership. Nonaka recognizes that cultivating this kind of leadership requires mechanisms for fostering and transferring the phronesis that is already embedded in individuals to create a system of distributed phronesis (Nonaka & Toyama 2007, p.385). However, these mechanisms have never been explicitly formulated.
- Kaiser and Fordinal (2010) introduced a special kind of 'ba' called 'vocation ba' for generating self-transcending knowledge within collective, knowledge-based vision

development processes. Criteria for the functionality of a guiding knowledge vision within this process have been formulated by Kaiser and Feldhusen (2011).

- Erden et al. (2008) then began focusing on group tacit knowledge. They conclude that it is not the aggregation of all individual tacit knowledge but has a meaning in itself, associated with various levels of quality (group assemblages, collective action, phronesis, collective improvisation). To create the context for collective action and to enhance the quality of group tacit knowledge on all levels they suggest to create a 'ba' of love, care, trust and commitment (Erden et al. 2008, p.15). Though, their work is restricted to descriptive work without rooting in theories of collective knowledge and learning. They propose that the factors that lead to high quality group tacit knowledge should be identified across organizational settings (Erden et al. 2008, p.15).
- Discussing the social characteristics of different types of knowledge, Smedlund (2008) concludes that 'emergent, potential knowledge' requires a specific kind of decentralized social network structure that is maintained by liberal norms, beliefs in innovativeness and an enabling type of trust (Smedlund 2008, p.63).
- Peschl and Fundneider (2008b) refer to this social network structure as a socio-epistemological framework that enables collective processes of high quality knowledge creation (Peschl & Fundneider 2008b, p.107). Peschl (2007a) formulated principles for 'enabling spaces', an interdisciplinary, multi-dimensional space that enhance processes of radical new thinking so that radical new knowledge can emerge organically from within the organization ('emergent innovation'). It comprises a physical, social, mental/cognitive, epistemological, as well as technological dimension.

To sum up, obviously, there has been some effort in theorizing and advancing the understanding of self-transcending knowledge and its enabling factors. But still, there seems to be a lack of comprehensive, inter- or transdisciplinary rooting in theories of collective knowledge, learning and cognition. One reason for the gap may be that - in contrast to other disciplines - contemporary epistemology has largely ignored the suggestion that knowledge might be produced by cognitive processes outside the human skin (Clark et al. 2012, p.87).

Indeed, the critique to Nonaka's model of knowledge creation (chapter 2.2) points at two essential issues within the field of knowledge management, which are still under discussion: the definition of the nature of knowledge as such and the question whether its management

and creation could follow universal principles, independent from language, culture or other backgrounds. There seems to be consensus that a holistic definition of knowledge – neither on individual nor on collective level - has not yet been found and a variety of epistemological and ontological assumptions lead to conceptual plurality, confusion, debate and failed expectations in knowledge management (Nonaka & Peltokorpi 2006; Gueldenberg & Helting 2007; Jakubik 2007; Faucher et al. 2008).

Conceptual confusion is even more the case within the field of self-transcending knowledge and its related concepts. A variety of approaches seem to share a common basis but vary in definition and derivation. Many questions have not yet been answered. What is the nature of the kind of future-building knowledge emerging on collective level and how does it relate to existing concepts like intuition, wisdom, or intelligence? At the roots of all concepts, is there a common ground where we can build on for further understanding? How can this field of knowing be accessed and utilized within a business environment for working groups or the entire organization? Are there universal principles or mechanisms that constitute an enabling 'ba'?

Jakubik comprehensively reviewed recent knowledge management literature and identified four emerging views of knowledge (Jakubik 2007, p.11): the epistemological view, commodity view, ontological view and community view of knowledge with each one focusing on a different classification. Figure 1.1 depicts her matrix and highlights the position of collective self-transcending knowledge: tacit, not-embodied, socially embedded knowledge (green).

Interestingly, concepts of self-transcending knowledge as well as concepts of collective knowledge have been found in the literature (yellow), but the link established within this dissertation, namely collective self-transcending knowledge as a social construct (red) has not been found so far, marking it as a new field of research within knowledge management.

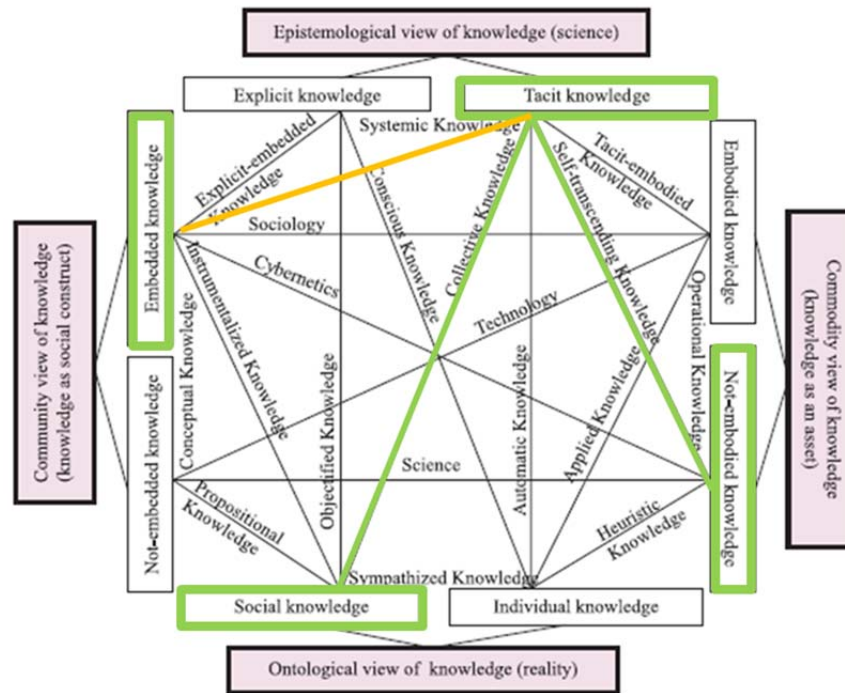


Fig. 1.1: Classification of Collective Self-transcending Knowledge (Jakubik 2007, p.11)

So far, there has been no work on correlating approaches in knowledge management, organizational learning and cognitive science to look for common or complementary ground in order to come to a consolidated theoretical framework for the emergence of self-transcending knowledge in collective settings.

Research Question

The aim of this dissertation is to theorize the concept of self-transcending knowledge in collective organizational settings and explore levers for the provision of required knowledge infrastructures for accessing this specific kind of knowledge. A theoretical framework for collective self-transcending knowledge will be formulated on a transdisciplinary basis.

Results are intended to give an answer to the following research question:

How can the emergence of self-transcending knowledge in collective organizational settings be rooted in theories of knowledge, learning and cognition?

Guiding sub-questions will be:

What is the **nature** of collective self-transcending knowledge?

- Is there a common ground in **understanding and defining** collective self-transcending knowledge and how does it relate to other concepts like intuition and collective wisdom?
- What are mechanisms that characterize the transition **from individual to collective** knowledge level? What does self-transcendence mean in collective settings?

What are **prerequisites** for its access and activation in collective settings?

- Are there specific **parameters** that determine whether groups are - or are not - superior to individuals? When does value emerge ($1+1=3$) on qualitative level, not only on quantitative level?
- What does it exactly mean to enable this kind of knowledge, to create a 'ba' for it?
- In which specific and dynamic context can (collective) knowledge be created and lead to (collective) wisdom (phronesis)?

Contribution of the Research

Due to its evolution from several disciplines knowledge management is seen as a 'mixed bag' which now needs a view that moves beyond objective and subjective views to generate research that matters (Nonaka & Peltokorpi 2006, p.81). The field greatly benefits from keeping its boundaries open which implies inclusion of different perspectives, various approaches and multiple epistemologies. (Nonaka et al. 2006, p.1200) Accordingly, Gueldenberg & Helting (2007, p.120) highlight the request for interdisciplinary work.

The same is true for organizational learning. Both disciplines are of highly differentiated nature and research spans the disciplines of economics, information systems, organizational behavior and theory, psychology, strategic management, and sociology. Each discipline and even each researcher focuses on one certain specific aspect of a fractal whole. Thus, it becomes increasingly important to address the question of integration across separate traditions in order to prevent from propagating a highly fractionated view. The field can benefit from identification of points of convergence and findings across disciplines that mutually reinforce each other. (Argote et al. 2003, pp.571–572)

This dissertation will provide such a view. Within a broader context of corporate competitiveness and sustainability, it will deliver a theoretical model based on transdisciplinary theoretical insights. This will provide a platform to formulate levers for practical application, thus specific impact factors for generation of essential, future-building knowledge. The research question will be answered by looking into theories that are engaged with future-building, creative, self-transcending processes of knowledge, learning and cognition that emerge within collective settings. In doing so, the dissertation will transcend disciplinary borders.

Research will provide one further step into the direction of the currently emerging community view of knowledge management which assumes social embeddedness of knowledge. It will deepen crucial aspects of collective knowledge creation and ways to come to it. It is expected to expand existing theory and explore the relatively young concept of self-transcending knowledge on an organizational level. Thus, the research seeks to contribute to the understanding of the fundamentals for successful organizational knowledge creation within the continuously changing environment of the knowledge economy. This will provide a basis for deriving concrete dimensions for organizing future-building knowledge processes. Even more, as the quality of knowledge has a direct impact on the quality of decision-making, research may also contribute to improved decision-making in an increasingly complex environment.

Findings may serve as a starting point for a variety of adjacent research themes, which could be the focus of subsequent projects, e.g.:

- Further empirical refinement of identified leverage dimensions
- Case-study research with companies of various sizes and organizational structure in order to test the framework on a broad quantitative empirical basis.

1.3 Transdisciplinary Research

As stated above, due to its evolution from several disciplines knowledge management is seen as a 'mixed bag' which now needs a new and cross-disciplinary view for further relevant research results. There is a huge amount of work in adjacent disciplines, which might help in

understanding and defining the kind of meta-knowledge under research. In order to give consideration to this specific nature of the research field, a transdisciplinary approach is chosen. Transdisciplinary research is characterized by an explicit intent to solve complex and multidimensional problems that are 'real-world' problems in order to create change (Wickson et al. 2006, pp.1048–1050). Contrary to multi- or interdisciplinary approaches it involves **dissolution of disciplinary boundaries**, which can be imagined as a 'fusion' of disciplines rather than a 'mixture' of disciplines as characteristic for the former two approaches. Transdisciplinary research offers the potential for integrating various epistemologies, theories, and practices. It requires to go beyond pure combination and to reflectively consider a certain body of knowledge A in light of B and vice versa. Different bodies of knowledge are "considered comparatively to uncover the underlying values and assumptions incorporated in each". Paradoxes which inevitably occur are understood as relating to different levels of reality adhering to different laws. (Wickson et al. 2006, p.1054)

Transdisciplinarity within this research refers to disciplines of knowledge management, organizational learning, complexity theory and cognitive science. At the beginning of the century, McElroy (2000) identified an imminent convergence of the former three communities as they concern themselves with the nature and role of knowledge and learning in human organizations. "Each of the three groups has something that the other two desperately need. There is an idea at stake here that is bigger than any one of them can defend alone, or even two of them together. **It takes all three to make it work.** KM and OL each lack a theory of how cognition happens in human social systems – complexity theory offers this missing piece". (McElroy 2000, p.196) At that time in 2000, Mc Elroy observed the three disciplines wrestling in their own narrow scope neglecting each other "like ships passing in the night". This has begun to change as we can observe the rise of complexity-based approaches in knowledge management and organizational learning. However, what is still rare is the explicit consideration of latest developments in cognitive science.

In order to find answers to the research question, a combination of comprehensive literature review and integrative theoretical work is embedded in an iterative approach of transdisciplinary research and model-building:

- comprehensive literature review in knowledge management, organizational learning and cognitive science to build the ground for explorative analysis
- crystallization and comparative analysis of main propositions on structures of transcending knowledge and collective knowledge
- deduction of crossdisciplinary propositions and integration into a coherent theoretical framework

1.4 Outline of the Dissertation

Following the structure of the research question, the research covers two areas of investigation as shown in figure 1.2: a stream of research exploring the nature of self-transcending knowledge and a stream exploring the nature of collective knowledge.

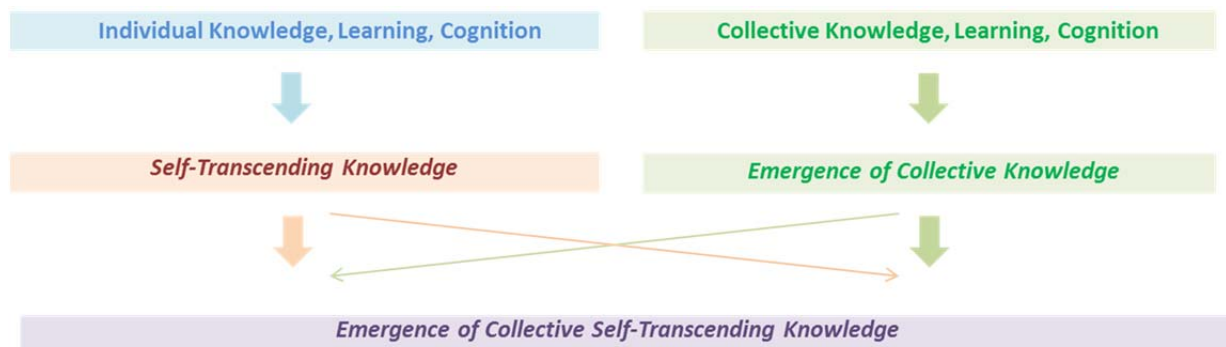


Fig. 1.2: Streams of Investigation and Research

In a first step, the thesis will develop a model of self-transcending knowledge based on constructivist epistemology and learning theory. A second step integrates insights from knowledge management, organizational learning and cognitive science into a complexity-based model of collective knowledge. Third, a model of collective self-transcending knowledge as a specific form of collective knowledge is derived by applying the model of self-transcending knowledge within the model of collective knowledge. A final step identifies dimensions and domains within this model that can provide leverage factors for facilitation of future-building knowledge processes.

Thus, the outline of the thesis will be as follows: In chapter 2 the thesis develops an understanding of state-of-the-art theories in management and knowledge management which form the economic frame for this dissertation and which offer a fertile ground for adopting concepts of dynamic, future-building knowledge processes. Chapter 3 explains the underlying understanding of the notion of knowledge and the idea of learning. Knowledge is portrayed as following the principles of subjectivity, social embeddedness and emergence. Learning is portrayed as a process which realizes human potential. Chapter 4 presents the specific concept of self-transcending knowledge, its roots and conceptual neighborhood before general characteristics are derived. In chapter 5, a theoretical model is developed for a corresponding learning process. In order to add the collective dimension to the model, chapter 6 explores concepts of collective knowledge and cognition. Chapter 7 develops a general model of collective knowledge and formulates its constituent domains and structure. This is then specified for the case of collective self-transcending knowledge by applying the model from chapter 5 within the model of collective knowledge. Chapter 8 gives a conclusion and outlook for further research.

2 Theoretical Foundation

The aim of this dissertation is to discover common ground between different areas of scientific interest and to develop a transdisciplinary framework within an issue that has become a melting pot for various disciplines: knowledge. So by its very nature, this dissertation will touch a variety of academic disciplines and will wander between them. Accordingly, it is important to anchor it at its roots, which are business administration and knowledge management. This chapter will present the disciplines' relevant theories which form the basis for this dissertation.

2.1 Business and Strategic Management

2.1.1 Knowledge Processes as Competitive Advantage

One of the fundamental concepts in market-based economic and organizational thinking is that of competitive advantage: In order to survive in a free market economy, players must display a feature or quality that is superior to features of other players within the market, thus establishing a unique selling proposition. Within this concept of sustainable competitive advantage we can differentiate three classes or waves of explanatory theories.

The initial **product- or activity-based** theory of the firm, which arose during the 80ies of last century, focuses on product differentiation and cost leadership as factors for competitive advantage. One of either advantage needs to be gained in a market environment which is seen as externally given. Advantages need to be continuously defended against competitors by market barriers such as large-scale production, learning curves or high buyer switching cost. (esp. Porter 1985)

During the early 90ies, subsequent approaches of the **competency- or resource-based** theory of the firm have developed. They postulate a concept of unique and distinctive corporate competencies or resources which ensure competitive advantage. These could be, for example, technology assets, resources of special talents of organizing, leading or motivating, certain development skills, or the ability to identify unmet consumer needs (Grant 1991; Barney 1991; Barney 1995). Twenty years later in 2011, Barney applied an

aphorism to the resource-based theory that is well-known for companies: it must “innovate or die” (2011, p.1312).

The third and latest class of theoretical approaches, the **knowledge-based** theory of the firm, reflects societies’ movement from industry societies to information societies and finally to knowledge societies. Knowledge and the firm’s capability to create and use new knowledge are seen as the most important source of a company’s sustainable competitive advantage. (eg. Nonaka & Takeuchi 1995; Grant 1996; Sveiby 2001; Coff 2003; Wiklund & Shepherd 2003)

Using elements from both the resource- and the knowledge-based view, the **dynamic capabilities paradigm** developed by Teece (Teece & Pisano 1994; Teece et al. 1997; Teece 2009) goes considerably beyond older paradigms, as it integrates ideas about **coordination and complementarities**. Teece recognizes that accumulation of resources, talents or knowledge assets is not enough to support significant competitive advantage, but that it requires **‘active orchestration’** (Augier & Teece 2009, p.412), i.e. the capability to effectively coordinate and redeploy internal and external competencies, and this in a timely, responsive, rapid and flexible way (Teece & Pisano 1994, p.1). Within the idea of ‘dynamic capabilities’, the term **‘dynamic’** refers to the capacity to renew competencies so as to address the continuous change in business environment and the uncertainty of future competition and markets. The term **‘capabilities’** emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment. (Teece et al. 1997, p.515).

Following this dynamic approach with a strong focus on capabilities of knowledge creation, leading knowledge management thinker Nonaka developed a radical new model of the **‘knowledge-based firm’** (Nonaka et al. 2008). By incorporating a **dynamic and subjective view** on knowledge and the behavior of corporate entities he made a **paradigmatic shift** from knowledge management to knowledge-based management. Knowledge-based management encompasses a holistic approach of corporate leadership and strategic management that established a new chapter in management theory. It concentrates on the capability to continuously create new knowledge in a **self-transcending process** as one of the most important critical success factors for sustainable competitive advantage. It is

assumed that the successful organization is the one that best enables the process of knowledge creation in form of a knowledge spiral (Nonaka & Peltokorpi 2006, p.79). Nonaka's model of the knowledge-based firm and its underlying theory of organizational knowledge creation will be introduced in more detail in chapter 2.2.

2.1.2 Sensing and Seizing Evolving Opportunities as Business Strategy

Emergent Strategy

In contemporary knowledge economies, organization's internal factors as well as the external environment change with an enormous speed and inherent complexity. It is evident that strategy processes and decision making which follow a chronological order of planning and realization are too static to result in sustainable success.

Contrary to the widespread understanding of strategy as an a priori, analytic process followed by its implementation, famous strategy scholar Mintzberg has always defined strategy as a "**pattern in a stream of decisions**" and realized strategy as "pattern in actions" (Mintzberg 1985, pp.257–258; Mintzberg et al. 2003, p.5). He concludes that strategy "walks on two feet", one deliberate and one emergent. The fundamental difference between deliberate and emergent strategy is that the former focuses on direction and control – getting desired things done – while the latter opens up a notion of '**strategic learning**' which is frequently the means by which deliberate strategies change. (Mintzberg 1985, pp.270–271)

Deliberate strategies are realized as intended: Intentions are set and then attention is focused on realizing them, not on adapting them. Messages from the environment are mostly ignored. In contrast, the concept of emergent strategy opens the process of strategy making up to the **notion of learning**. Patterns or consistencies are realized despite, or in the absence of, intentions. Emergent strategy itself implies **learning what works** – taking one action at a time in search for a viable pattern or consistency. It does not mean chaos, but 'unintended order' (Mintzberg 1985, p.257,271). It does not mean that management is out of control, but that it is open, **flexible and responsive, in other words, that it is willing to learn**. This is exactly that behavior which is especially important when an environment is too unstable or complex to comprehend. "Openness to such emergent strategy enables

management to act before everything is fully understood – to **respond to an evolving reality rather than having to focus on a stable fantasy.**”(Mintzberg 1985, p.271)



Fig. 2.1: Deliberate and Emergent Strategies (Mintzberg et al. 2003, p.5)

According to Mintzberg, deliberate strategy and emergent strategy form two ends of a continuum along which real-world strategies lie. Managing requires a ‘light deft touch’ – to direct in order to realize intentions while at the same time responding to an unfolding pattern of action. The relative emphasis may shift from time to time but not the requirement to attend to both sides of this **directing/responding dialectic**. Whereas the more deliberate, directing strategies tend to emphasize central direction and hierarchy, the more emergent, responding ones open the way for **collective action and convergent behavior**. For Mintzberg, knowledge about the responding side and the ability to recognize evolving patterns are crucial for effective management. Effective strategic choice of an organization requires a high degree of **self-awareness** on the part of all members of the patterns of its own actions and their consequences over time. (Mintzberg 1985, pp.271–272)

Sensing and Seizing Opportunities

The notion of emergent strategic learning through recognition of and response to evolving patterns can also be found within Teece’s **dynamic capabilities** approach. Its unique and difficult-to-replicate dynamic capabilities that ensure sustainable advantage include the capacity to sense, shape and seize evolving pattern, i.e. evolving opportunities (Teece 2009, p.4). Dynamic capabilities are defined as “the ability to sense and seize new opportunities,

and to reconfigure and protect knowledge assets, competencies, and complementary assets with the aim of achieving a sustained competitive advantage". (Augier & Teece 2009, p.412)

The dynamic capabilities paradigm sees the firm as an incubator and repository for difficult-to-replicate co-specialized assets. The management introduces and seeks novelty on the one hand and promotes and shapes learning on the other hand. Management must lead in the way that it senses new opportunities and leads the organization forward to seize them. (Augier & Teece 2009, p.418) However, Teece stresses that the ability to recognize opportunities depends in part also on the individual's capabilities and extant knowledge. It depends on the knowledge and learning capacities of the organization to which the individual belongs and requires specific knowledge, creative activity, and practical wisdom throughout the organization (Teece 2009, p.11).

Even more, **firms and markets coevolve** (Augier & Teece 2009, p.416). The firm's dynamic capabilities alone do not shape markets but they also require firm-level responses by competitors, suppliers, and customers. The coordinating and resource allocating capabilities shape markets, as much as markets shape firms. In such an environment, "Disequilibrium is rampant, and great uncertainty with respect to plans and outcomes is the norm. Organizations both adapt to and help shape their environments." (Augier & Teece 2009, p.412)

Following Teece, the identification of new opportunities and organizing effectively and efficiently to embrace them cannot be based on pure rational optimization assumptions. It requires the firm's ability to orchestrate nontraded - and nontradable - assets, so that they are in their first best use and so that **cospecialization economies** are captured. The dynamic capabilities framework assumes that managers are "at best boundedly rational" and applies a **profit-seeking but not profit-maximizing** framework. (Augier & Teece 2009, p.412)

2.1.3 Practical Wisdom and Common Good as Business Value

Practical Wisdom

This notion of 'not-profit maximizing' practical wisdom within strategic management has been worked out in detail by Nonaka & Toyama (2007). They identified three major problems with the rationalist approach of strategic management: first, it overlooks the

aspect of strategy that is based on practice in a particular context, second, it forgets the subjective aspects of strategy, and third, it misses the fact that strategy is a process of creating the future. (Nonaka & Toyama 2007, p.372)

Reflecting these **practical, subjective, and future-creating aspects**, Nonaka and Toyama formulated their approach of phronetic leadership through distributed practical wisdom. It understands strategy as a dynamic process that is created and practiced by human beings that follow their **ideals, values and visions**. Organizations differentiate themselves by their unique abilities to foresee and envision future, to sense and seize new opportunities towards their realization. (Nonaka & Toyama 2007, pp.372, 375) These values and value-based decisions of people determine the way of life in an organization, its *raison d'être*, and the value the organization creates. (Nonaka et al. 2008, p.3)

Within the approach of phronetic leadership, strategy emerges as a **dynamic, knowledge-based, just-in-time process of creating the future through distributed wisdom**, the latter being called **phronesis**. (Nonaka & Toyama 2007, p.372). The concept of phronesis builds on Aristotele's distinction between three types of knowledge: episteme (context-independent, universal truth), techne (context-dependent know-how, practical creative skills), and phronesis, which can be translated roughly as "prudence, ethics, practical wisdom or practical rationality". Nonaka and Toyama describe phronesis as the "high quality tacit knowledge acquired from practical experience that enables one to make prudent decisions and take action appropriate to each situation, guided by values and ethics." (Nonaka & Toyama 2007, pp.377–378).

Following the approach of phronetic leadership, the firm doesn't just plan for the future, but it continuously creates the future, as already shown within Mintzberg's approach of emergent strategy. Strategy is created out of one's existential belief or commitment to a vision of the future and the ability to interpret one's environment and resources both subjectively and in combination with objective information in a continuous interplay that is **open, inclusive, and collective**. (Nonaka & Toyama 2007, p.391) These abilities need to be distributed among organizational members to form distributed phronesis. Since a firm is an entity that pursues a universal ideal and a particular reality at the same time, **strategy emerges from idealistic pragmatism**, the practice to pursue 'common goodness' in each particular situation. (Nonaka & Toyama 2007, p.372)

Nonaka and Toyama understand phronesis as an intellectual virtue. In general it can be described as the **ability to determine and undertake the best action in a specific situation to serve the common good**. In a business context, it is the ability to understand and bring to fruition that which is considered good by individual customers in specific times and situations. (Nonaka & Toyama 2007, p.378). It does not mean that each individual should pursue what is good only for himself/herself but that each individual has the ability to judge goodness for the common good. This kind of judgment **requires a higher point of view** to be able to see what is good for the whole, even though that view stems from one individual's values and desires. It is the ability to synthesize a general, universal knowledge with the particular knowledge of a concrete situation, to grasp the essence of particular situations and things. (Nonaka & Toyama 2007, p.380)

To be able to make these right decisions, managers need to understand why a company exists – its **raison d'être which is beyond financial interests**. (Nonaka & Takeuchi 2011, p.61) Nonaka & Toyama see profit as something gained as a result of exercising phronesis, rather than the ultimate goal of the firm. For them, money is not goodness in itself, but a means to achieve a goal, that is, goodness. (Nonaka & Toyama 2007, p.381) “The essence of business is not about bettering the competition to maximize profit. [...] Excellence only emerges with an unyielding commitment and practice to serve the common good of the company, its employees, its customers and other stakeholders, and the larger society, based on the company's own vision and values. [...] Profit is a result of such a value creation, not a purpose in itself.” (Nonaka et al. 2008, p.3)

“Creating the future, however, must extend beyond the company; it must be about pursuing the common good. CEOs need to ask if decisions are good for society as well as for their companies; management must serve a higher purpose. Companies will then start thinking of themselves as social entities charged with a mission to create lasting benefits for society. Unless companies create social as well as economic value, they will not survive in the long run.” (Nonaka & Takeuchi 2011, p.60)

Common Good

While Teece's ambition to integrate practical wisdom within the dynamic capabilities framework was to explain the sources of sustainable, competitive advantage that can result in profit seeking (Teece 2009, p.5), Nonaka's position is that profit is a result of a value-creation that serves the common good, but not a purpose in itself (Nonaka et al. 2008, p.3). The concept of shared value (Porter & Kramer 2011) may be able to link Teece's and Nonaka's positions. It focuses on identifying and expanding relations between societal and economic progress, thus demonstrating the connection between corporate profit and common good.

Porter and Kramer see companies trapped in an outdated approach to value creation that has emerged over the past few decades. Viewing value creation narrowly as optimizing short-term financial performance ignores the broader influences that determine their longer-term success. Porter and Kramer propose the principle of shared value as a solution which involves **creating economic value in a way that also creates value for society by addressing its needs and challenges**. They demand that business must reconnect company success with social progress. (Porter & Kramer 2011, p.64)

Porter and Kramer argue that at a very basic level, the competitiveness of a company and the health of the communities around it are **closely intertwined**. A business needs a successful community, not only to create demand for its products but also to provide critical public assets and a supportive environment. Vice versa, a community needs successful businesses to provide jobs and wealth creation opportunities for its citizens. According to traditional strategy theory, a company must create a distinctive value proposition that meets the needs of a chosen set of customers. The shared value approach recognizes this field of vision simply as too narrow and expands it to the **needs of the whole society**. The concept of shared value **resets the boundaries of capitalism**. By connecting companies' success with societal improvement, it blurs the line between for-profit and nonprofit organizations.(Porter & Kramer 2011, pp.66–67)

Porter and Kramer distinguish between **higher and lower forms of profit**. "Not all profit is equal. Profits involving a social purpose represent a higher form of capitalism, one that creates a positive cycle of company and community prosperity." (Porter & Kramer 2011, p.75) Shared value focuses companies on the right kind of profits – profits that create

societal benefits rather than diminishing them. This is not social responsibility, philanthropy, or sustainability, but self-interested behavior. If all companies individually pursued shared value connected to their particular businesses, society's overall interests would be served. (Porter & Kramer 2011, p.77)

Redefining the purpose of the corporation as creating shared value, not just profit per se, will drive the **next wave of innovation** and productivity growth in the global economy. "Realizing shared value will require leaders and managers to develop new skills and knowledge – such as a far deeper appreciation of societal needs, a greater understanding of the true bases of company productivity, and the ability to collaborate across profit/nonprofit boundaries." (Porter & Kramer 2011, p.64) The concept of shared value recognizes that societal needs, not just conventional economic needs, define markets. Shared value is not about personal values. It is about expanding the total pool of economic and social value. (Porter & Kramer 2011, p.65)

2.1.4 Generative Fields of Attention for Economic and Societal Change

The preceding sections have portrayed an understanding of the knowledge-creating and future-creating company which is embedded within dynamic societal context and values. This approach can also be found within the underlying thoughts of **Scharmer's** innovative work on Theory U (Scharmer 2007b). Theory U presents a knowledge-based model for sustainable change processes to meet the need of positive economic and societal change. Key driver within that approach is advanced collective capacity and action as under research within the scope of this dissertation.

For Scharmer, sensing and seizing opportunities comprises the capacity to sense and **actualize emergent realities**. He explains it as perceiving the most attractive and compelling version of the future at the very moment it emerges and acting on it instantly and appropriately. Similar to Mintzberg and Teece, in a world of continuous and rapid change, this capacity is considered as the most critical source of future competitive advantage which will distinguish successful leadership from the rest. (Jaworski & Scharmer 2000, pp.2, 39)

Theory U is based on the fundamental insight that the way we pay attention to a situation, individually and collectively, determines how this situation develops, what path the system

takes and how it emerges. Scharmer puts it in short words: “I attend [this way], therefore it emerges [that way]. (Scharmer 2009, p.13) However, human beings are usually blind to the source of their attention, which is the **source dimension** from which they operate and from which actions come into being. If we want to sense and seize emerging opportunities and shape them in order to consciously create positive societal and economic change, we need to actively illuminate and enter this ‘blind spot’. (Scharmer 2009, p.6) When we succeed in operating from this deeper source of knowing we are able to act upon the emerging future and enact one’s best future possibility. Within a knowledge terminology, Scharmer denotes this as accessing self-transcending knowledge (Scharmer 2001) in order to be able to learn from the future as it emerges. These are the core concepts of this dissertation and will be presented in detail in chapters 3.2.4 and 4.

Scharmer follows the distinction between management and leadership in that management is about ‘getting things done’ and leadership is about creating and cultivating the larger context – the fertile common ground and soil – in which things can happen. (Scharmer 2009, p.73) For Scharmer, the **essence of leadership** is to shift the inner place from which we operate both individually and collectively, (Scharmer 2009, p.11) to illuminate the blind spot and enter the source dimension.

To succeed in this, Scharmer proposes a U-shaped journey of **five movements** in order to shift from reactive fields of attention to generative ones: (eg. Scharmer 2009, p.377ff.)

- **co-initiating:** uncover common intent; stop and listen to others and to what life calls you to do
- **co-sensing:** observe, observe, observe; connect with people and places to sense the system from the whole, go to the places of most potential and listen to your mind and heart wide open
- **presencing:** connect to the source of inspiration and will; retreat and reflect, go to the place of silence and allow the inner knowing to emerge
- **co-creating:** prototype the new in living examples to explore the future by doing
- **co-evolving:** embody the new in ecosystems that facilitate acting from the whole

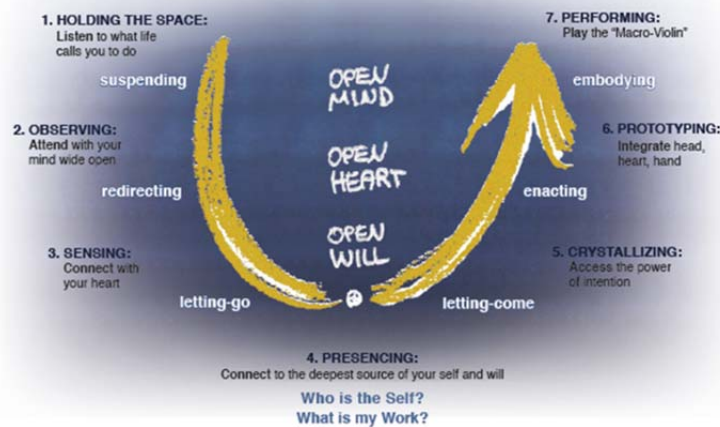


Fig. 2.2: Theory U (Scharmer 2007a, p.12)

Again, to go through this U-process on an organizational level requires an inner journey that is based on **seven essential leadership capacities**: holding the space, observing, sensing, presencing, crystallizing, prototyping and performing.

The first three qualities facilitate an opening process on the left side of the U which is able to deal with the resistance of thought (voice of justice), emotion (voice of cynicism) and will (voice of fear) to change and to the new. At the bottom of the U lies an inner gate that requires people to drop everything that isn't essential and welcome their highest future possibility. (This process of 'presencing' will be discussed in more detail in chapter 3.2.4.) In order to be able to act upon the emerging inner knowing and to practically apply any upcoming vision, it then requires reintegrating the intelligence of head, heart and hand. This process is represented by the latter three capacities which describe the reintegration process on the right side of the U. (Scharmer 2009, p.38ff.) Both processes, opening and reintegration, are important facilitators in creating powerful breakthroughs and connecting to one's best future possibility (Scharmer 2007a, p.5,11).

2.1.5 Summary

In the highly dynamic knowledge economy, the source of competitiveness is in the ability to adapt, in practice, to continuous change. (Nonaka & Toyama 2007, p.373) Strategic management need to be recognized as something which cannot be planned, but emerges as

a **'just-in-time-strategy'** (Weick 2001, p.352) **based on insight, vision and intuition** (Mintzberg 2004, p.10). Strategy is not about determining a static optimum that needs to be reached but about continuously envisioning, creating and changing the future.

The theories presented in the chapters before outline an understanding of business and its related activities that is characterized by the following propositions:

- The firm gains a unique, competitive, and sustainable position in a cospecialized and co-evolving economy through a dialectic process of both **creating and letting evolve the emerging future**. This dialectic process implies directing and responding (Mintzberg) at the same time, resp. sensing and actualizing (Scharmer) at the same time. Top management does not make strategy but works to create the conditions in which new strategies can emerge and evolve.
- In an ever changing world, this 'learning what works' happens through dynamic, subjective and self-transcending **knowledge processes** (Nonaka) that actively and continuously orchestrate individual capabilities and knowledge (Teece).
- This knowledge generation is facilitated by visions, learning frameworks and distributed idealistic pragmatism that follow a value-guided, holistic, **common good perspective** where profit is not individually maximized but sought to serve a higher purpose and meet societal needs.
- In order to grasp this holistic essence (Nonaka) in situations and decisions, and to drop the non-essentials (Scharmer), members of the organization need abilities for the adoption of a higher point of view (Nonaka), for **self-awareness** (Mintzberg) and self-transcendence (Nonaka).
- Technologies for collective access to generative fields (Scharmer) and for **collective action** (Mintzberg) need to be invented and applied.

2.2 Knowledge Management

2.2.1 Evolution of Knowledge as Economic Factor

Long before the term knowledge society was known, Peter Drucker (1973) coined the term 'knowledge worker' in contrast to manual workers, hinting at the dawning shift from the industrial to the knowledge economy. It was recognized that "economic prosperity rests upon knowledge and its useful application" (Teece 1981). Later, knowledge and the capability to create and utilize such knowledge were acknowledged as the **most important source of a company's sustainable competitive advantage** (Prahalad & Hamel 1990; Nonaka 1991; Nelson 1991; Cyert et al. 1993; Nonaka & Takeuchi 1995; Spender 1996). An increasing relevance of knowledge as input and output factors for corporate activities then triggered the need for active management of this factor that rapidly was considered as "the only meaningful resource" (Drucker 1993). This chapter presents the knowledge management concepts which are the basis for this dissertation.

Early approaches to knowledge management simply fitted the newly recognized business factor into established neoclassical economics and successive organizational theories of the firm. These had been emanated from the Western scientific philosophy of Cartesian dualism that assumed the division of object and subject, thus, a static, passive and rational view on human individuals and companies. Structural theories of competitive advantage, like Porter's activity-based approach (Porter 1985) of cost leadership and differentiation, followed an objective and static view of the firm as a stable atomic, information-processing entity that manages resources rationally and strives for a kind of externally given, optimal state of profit maximization. These approaches could only serve for an **objective, static understanding of knowledge**, detaching economic knowledge and economic subject. Fitting knowledge into such a framework led to an isolated knowledge management discipline that mainly aimed at storage of a kind of knowledge asset in databases, handbooks or other storage media and rather resembled information management than knowledge management (Spender & Scherer 2007, p.6). Humans were also being treated as just another, i.e. as an objective factor. The pursuit of good business and science required one to exclude the "noise of human subjectivity" (Nonaka et al. 2008, p.2) in the search for objective facts and universal rules.

During the 80ies, Nelson & Winter (1982) introduced the **cognitive dimension** into economics by presenting an Evolutionary Theory of Economic Change that considered companies as source and base of knowledge. At the same time, **humanistic thinking** and a look inside the firm emerged within business theory bringing values (Peters & Waterman 1982), organizational culture (Schein 1989) and organizational learning (Argyris & Schön 1978; Senge 1990) to the agenda of strategic research. The perception of the firm as a unique bundle of non-imitable resources or core competencies that establish competitive advantage (Prahalad & Hamel 1990; Grant 1991; Barney 1991; Conner & Prahalad 1996; Kogut & Zander 1996) superseded the static structural views and developed into new, dynamic approaches such as the dynamic capabilities approach (Teece et al. 1997).

Massive exploration of the thing or substance knowledge as such led to greater appreciation for the human involvement and participation in its management. There was a quest for radical new ideas and approaches to organizational theorizing from beyond the usual disciplinary boundaries as a coherent knowledge-based theory still seemed to hide (Spender & Grant 1996, p.5,9). Assuming that the most important resource, i.e. knowledge, resides within the individual subject, Grant (1996) approached a subjective knowledge-based view as an outgrowth of the resource-based view. Within his concept of managing knowledge-based assets, Sveiby (1997) stressed the importance of intangible assets including employee competence and therefore defined knowledge transfer as key activity in organizations. Also Davenport et al. (1998; 2001) emphasized that knowledge is closely linked to the people who hold it and that it requires experience, context, interpretation and reflection for its application to decisions and actions.

Nonetheless, these knowledge-based views could not fully leave behind the static, passive, rational Cartesian paradigm. They still saw the primary role of an organization and the essence of knowledge management in accessing, transferring and **applying existing knowledge, rather than in creating new knowledge.**

To leave this paradigm means to turn our attention toward the source rather than the object of knowledge. (Senge et al. 2004, p.42) Indeed, Davenport foresees that knowledge management will rise to **attention management** as knowledge is created and applied only in the minds of human beings and human attention. (Davenport & Voelpel 2001, pp.217–218)

2.2.2 Nonaka's Knowledge-based Management

Japanese management scholar Nonaka recognized exactly this as the essential lack in Western perspective on knowledge management: the failure to **capture the dynamic human process of knowledge creation** and to consider it as the most important activity of the firm, and even as its *raison d'être* (Nonaka, Toyama & Nagata 2000, pp.2–3). His approach of knowledge-based management, later referred to as organizational knowledge creation theory, complements the knowledge-based view of the firm and the dynamic capabilities approach. (Nonaka & von Krogh 2009, p.640)

Nonaka recognized that knowledge is different in nature from information or physical resources, as it is born of human interaction. It underlies **subjective and dynamic** contexts and therefore knowledge itself is subjective and dynamic. According to Nonaka, research has to deal with the issue of subjectivity in management, not only because it is impossible to exclude it, but because it is the very thing to examine to build a theory of the firm based on knowledge and its creation. (Nonaka et al. 2008, pp.7–8) “Knowledge cannot exist without human subjectivities and the contexts that surround humans. Truth differs according to who we are (**values**) and from where we look at it (**context**). In organizational knowledge creation, it is such differences in human subjectivities that help create new knowledge.”(Nonaka & Toyama 2005, p.421)

Nonaka's consequent subjective and dynamic understanding of both, knowledge and the behavior of corporate entities (Nonaka 1994), initiated a paradigmatic shift **from static knowledge management to dynamic knowledge-based management**. Instead of fitting knowledge management into existing theories, Nonaka revealed the need for a radical new perspective of the firm that adequately reflected the role of knowledge inside and outside the firm. Based on his unified model of dynamic knowledge creation (Nonaka, Toyama & Konno 2000) he developed a process theory of the knowledge-creating firm (Nonaka & Toyama 2005). This approach could synthesize scientific and humanistic approaches, i.e. objectivity and subjectivity, establishing a new chapter in management theory and knowledge management.

In this holistic approach of corporate leadership and strategic management, Nonaka regards companies as dynamic knowledge-based entities operating in an ecosystem of knowledge.

They **reshape this environment and themselves through continuous knowledge creation**, and their capability to actively do so is considered to be one of the most important sources for competitive advantage (Nonaka 1991, p.96). Consequently, the **focus is on the process of knowledge creation itself and its enablers**, not on managing the knowledge assets, which are referred to as inputs and outputs of this process (Nonaka et al. 2008, p.27). Driver and core enabler of the entire dynamic process is leadership that is based on phronesis. (Nonaka et al. 2008, p.53).



Fig. 2.3: A Process Model of the Knowledge-based Firm (Nonaka et al. 2008, p.27)

The whole model of the knowledge-based firm consists of seven basic components: (Nonaka et al. 2008, p.27).

- the SECI process of **dialogue** and **practice**;
- the **knowledge vision** and **driving objectives**, which give direction and energy to SECI;
- **ba**, a space-time nexus for the SECI process to occur; a dynamic, shared context of interaction, interpretation and dialectical processes.
- **knowledge assets**, which are the inputs and outputs of the SECI process;
- the **environment**, as an ecosystem of knowledge and multilayered ba.

Phronetic leadership (see chapter 2.1.3) is seen as the dynamic process that connects these components to generate new knowledge – vice versa knowledge results in wise leadership through phronesis (Nonaka & Takeuchi 2011, p.59) The SECI spiral, the knowledge vision and

the ba-concept form the key concepts of Nonaka's theory of organizational knowledge creation and will be explained in more detail in the following.

2.2.3 SECI Process, Knowledge Vision, Ba-concept

SECI Process of Dialogue and Practice

The SECI process model of organizational knowledge creation is based on Nonaka's epistemological distinction between personal tacit knowledge originating in the body, experience, thoughts and beliefs of an individual and objective explicit knowledge codified in words, formula etc. (Nonaka et al. 2014, p.3). Nonaka derived this distinction from Polanyi's (1967) philosophical thoughts on the tacit dimension of knowledge. The tacit dimension of knowledge as well as the validity of claiming two distinct categories of knowledge will be discussed in more detail in chapter 3.1.2.

For Nonaka, tacit and explicit knowledge are two types of knowledge which are not exclusive but complementary. Although they contrast each other, they are not mere opposites, but rather lie on a continuum. (Nonaka et al. 2014, p.3) "Tacit and explicit knowledge do not exist separately, but rather, like the visible and submerged portions of an iceberg, form a continuum." (Nonaka et al. 2008, p.18) In complementing and converting each other they form the essential basis for knowledge creation. New knowledge is created in a process of interaction between them, rather than from tacit or explicit knowledge alone (Nonaka, Toyama & Konno 2000, p.8) These interactions are theorized as processes around four modes of **knowledge conversion** between tacit and explicit knowledge: socialization of individuals (tacit to tacit), externalization within groups (tacit to explicit), combination in organizations (explicit to explicit) and finally again internalization in individuals (explicit to tacit). (Nonaka, Toyama & Konno 2000, pp.9–11; Nonaka et al. 2008, p.20) As the term 'conversion' might be misunderstood in a way that knowledge was a substance that could be processed like physical resources, Nonaka stresses that the SECI model is meant to be a framework or snapshot of the process of knowledge, which enables analysis and evaluation to make sense of the flowing real world. (Nonaka et al. 2008, p.19).

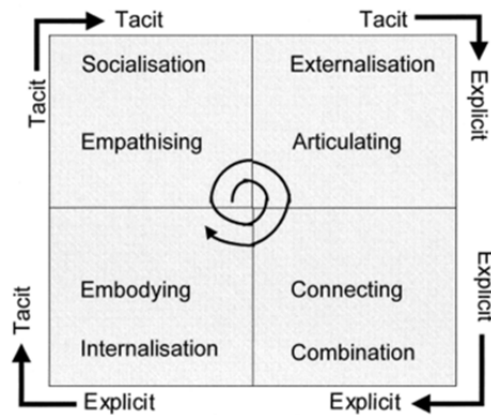


Fig. 2.4: The SECI Spiral (Nonaka, Toyama & Konno 2000, p.12)

Through the four conversion modes, the SECI process socially validates personal subjective knowledge and synthesizes it with others' knowledge. As a result, knowledge keeps expanding in an **upward spiral**. (Nonaka & Toyama 2005, p.433,422). "When an individual's tacit knowledge is shared with another person it becomes explicit knowledge, and when this is merged with other explicit knowledge it becomes new explicit knowledge, which in turn can then be converted into the tacit knowledge of an(other or the same) individual and thus link with the subsequent conversion process. Innovation emerges from the spiraling continuity of this conversion process." (Nonaka et al. 2014, p.3) Knowledge creation is described as a **self-transcending process**, where individuals interact with each other to reach out beyond the boundaries of their own existence and transcend the old self into a new self by acquiring a new context, a new view of the world and new knowledge, and as a result, change themselves, others, the organization and the environment. (Nonaka, Toyama & Konno 2000, p.8,13; Nonaka & Toyama 2005, p.421)

The SECI spiral represents an interactive, **dialectical process** of synthesizing contradictions, e.g. different views of different people, subjectivity and objectivity, and in particular, the two types of knowledge. Essential means to achieve synthesis of contradictions are synthesizing thoughts through **dialogue** and synthesizing action through **practice**. (Nonaka et al. 2008, pp.30–33) While dialogue seems to be an effective method for knowledge conversions through externalization and combination, practice seems to be an effective way for socialization and internalization of knowledge. (Nonaka & Toyama 2005, pp.425–427)

- **Dialogue** in form of dialectical thinking pursues the essential meaning of things. It puts everything into a context and understands it in relation to the whole, instead of considering it as an absolute truth. Dialogue enables us to understand that there are different views from our own and that we may make mistakes. It helps learning, accepting and synthesizing different views, pushing us to “a higher plane in pursuit of the essence of things”. In order to gain such a quality, dialogue requires an open mind and the ability to be both self-assertive and modest. (Nonaka et al. 2008, p.32).
- **Practice** in the form of ‘reflection in action’ can synthesize contradictions that cannot be resolved by logical analysis alone. Following Dewey’s concept of pragmatism (see also chapter 3.2 on learning) Nonaka means by practice that we “think deeply about the essential meaning of our actions and their outcomes while we are performing them, and to use the results of this reflection to correct them”. Reflection on action is understood as a metacognitive understanding that synthesizes insiders’ and outsiders’ viewpoints as it combines logical, objective analysis with subjective observation and experience. (Nonaka et al. 2008, p.33)

Knowledge Vision

While knowledge assets represent an organization’s past, and knowledge creation represents the present, knowledge visions represent the future. (Nonaka et al. 2006, p.1198). Knowledge visions specify a ‘potentiality for being’ (Nonaka et al. 2006, p.1188) and determine the collective ideal mission and domain, an idealized future state which leaders develop as mental image through personal aspirations and collective sense-making. (Nonaka & Toyama 2005, p.432) A knowledge vision gives **corporate planners** a mental map of three related domains: (1) the world they live in, (2) the world they ought to live in, and (3) the knowledge they should seek and create (von Krogh et al. 2000, p.103)

For Nonaka, knowledge creation can be thought of as a process of **realizing one's vision of the future** or personal belief through the practice of interaction with others and the environment. (Nonaka & Toyama 2007, p.372) Thus, the essential prerequisite to give direction and energy to the continuous organizational knowledge-creating process is the existence of such a knowledge vision that acts as a road map for all corporate activities. (von Krogh et al. 2000, p.105; Nonaka et al. 2008, p.27) “To create knowledge dynamically and

continuously, an organization needs a vision that synchronizes the entire organization. [...] It gives a direction to the knowledge-creating process, and the knowledge created by it, and determines how the organization and its knowledge base evolve over the long term.”(Nonaka, Toyama & Konno 2000, p.23)

Moreover, when the existence of such a corporate knowledge vision is one of the single most important requirements for successful continuous knowledge creation, then it is key for sustainable competitive advantage. As stated in the previous chapter, Nonaka advances the proposition that firms differ not just because they have heterogeneous resources, as stated in the resource-based theory, but because managers have different visions of the firm’s future. “In the knowledge economy, the firm doesn’t just plan for the future, it continuously creates the future. What differentiates firms from one another is their vision of the future and their practical ability to act to realize that future by using their aesthetic sensibilities to create knowledge.”(Nonaka et al. 2008, p.xi,2)

To serve this quality, a knowledge vision needs to be a vision that **transcends the existing boundary**, which is, for example, boundaries of existing products, capabilities, divisions, organizations and markets. Such a guiding vision arises from confronting the fundamental question: ‘Why do we exist?’ By going beyond profits and asking ‘Why do we do what we do?’ the mission and domain of the firm becomes defined. [...] While the strategy of a firm can change as the situation unfolds and uncertainty about the future decreases, the knowledge vision does not change so easily since it stems from the fundamental ontological question of the firm’s *raison d’être*. The knowledge vision defines a consistent value system to evaluate and justify the knowledge created in the organization and therefore needs to be based on an absolute value which goes beyond financial matrices. (Nonaka & Toyama 2005, p.424)

Very clearly, the key to such a self-transcending process of organizational leadership and creation is **personal commitment**, the employees’ sense of identity with the enterprise and its mission (Nonaka & Takeuchi 1995, p.97) as well as active commitment from all the members of the organization, not just from a few elites (Nonaka & Toyama 2005, p.431), so that knowledge creating interactions ideally are “voluntarily created and managed, not by a plan or order from the headquarter”(Nonaka, Toyama & Konno 2000, p.20). However, it is top management’s role to envision the future and provide the knowledge vision. Middle

managers then break down the vision or driving objective into concrete concepts and are responsible to build and energise 'ba'.(Nonaka & Toyama 2005, pp.431, 427)

The Concept of 'Ba'

Following philosophers' discussion on the importance of place in human cognition, Nonaka introduced the concept of such places to knowledge creation. He used the term '*ba*' to describe the place where the dialectical SECI process of dialogue and practice occurs. Ba roughly means 'place' in Japanese and Nonaka defines it as "a **shared context in motion**, in which knowledge is shared, created and utilized". (Nonaka & Toyama 2005, pp.427–428)

Knowledge and knowledge creation is context specific in terms of time, space, and relationships with others. It takes place within context as social, cultural and historical contexts provide the basis for individuals to interpret information to create meanings. Ba is such a place where information is interpreted to become knowledge. It provides the energy, quality and place to perform the individual conversions of the SECI process and to move along the knowledge spiral. (Nonaka, Toyama & Konno 2000, pp.14–15). "A typical informal ba can be found in a gathering of people in a pub, where participants talk in a friendly and open atmosphere about their 'here-now' in a way that sometimes triggers insight and resolution." (Nonaka et al. 2008, p.35)

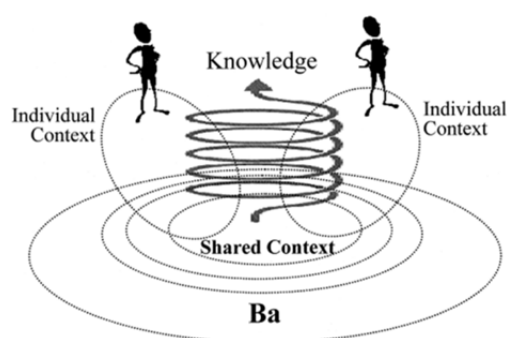


Fig. 2.5: Ba as a Shared Context in Motion (Nonaka, Toyama & Konno 2000, p.14)

Rather than the space itself, the **essence of ba is interaction** and the contexts and the meanings that are shared and created through this interaction. Ba means not just a physical space, but also a specific time and space, or relationship of those who are at the specific

time and space. The concept unifies **physical space, virtual space and mental space**, such as shared ideals. (Nonaka & Toyama 2005, p.428) Ba is the context shared by those who interact with each other, and through such interactions, participants and context itself evolve through self-transcendence to create knowledge. (Nonaka, Toyama & Konno 2000, p.15)

Ba is the place where one engages in dialectical dialogue and practice to implement the vision of the firm. As participants bring in their own contexts to share and create new meanings through interaction, ba needs **permeable boundaries** and participants with **multiple viewpoints** and backgrounds. Ba can emerge in various settings: in individuals, working groups, project teams, temporary meetings, or virtual space such as email groups. Organizations can be viewed as organic configurations of **multi-layered ba**. (Nonaka & Toyama 2005, pp.428–429) The emerging relationship in ba is in continuous change as the contexts of the members as well as the members itself change. (Nonaka et al. 2008, p.35) Ba is of highly dynamic nature with **'here and now'** quality. (Nonaka, Toyama & Konno 2000, p.15). It is a 'continuously created generative mechanism that explains the potentialities and tendencies that either hinder or stimulate knowledge creating activities' (Nonaka & Toyama 2003, p.6). "Ba is a process of indwelling in a 'here-now' situation that transcends time and space." (Nonaka et al. 2008, p.40)

To participate in ba means to deeply get involved and **transcend one's own limited perspective**. "Ba is a place of **cotranscendence**, requiring an intentional self-involvement with the other persons, object, or situation by transcending subject/object distinctions to experience the immediate present directly. [...] one exists in relationship with others rather than in the atomistic sense of absolute self. In ba, one can lose oneself to be open to others. [...] Through relationships in ba, one can see oneself in relation to others and embrace others' views and values, enabling an understanding and sharing of subjective viewpoints. [...] In ba the individual's internal viewpoint resonates in tandem with the external viewpoint of the other, or the group. It is not an either/or proposition, but both/and". (Nonaka et al. 2008, p.36) Nonaka interprets 'losing oneself' or 'transcending oneself' as a loss of self-consciousness as similarly described in flow experiences by Csikszentmihalyi (1990).

Ba can be built intentionally or emerge spontaneously. In order to tie space, time and people together to become a ba, a variety of features must be in place: (Nonaka et al. 2008, pp.37–38)

- Ba must be self-organized and possess its own **intention**, objective, direction, and mission.
- Ba participants must establish a **shared sense of purpose**.
- Ba requires participants with **different types** of knowledge.
- Ba needs **boundaries**, but these must be open.
- Ba requires the **commitment** of participants.
- Ba needs a process of **mutual understanding, trust**, and respect, as well as shared perceptions and active empathy.

Thus, ‘energising’ conditions that help establishing such ba’s in organizations are **autonomy** (self-organization), **creative chaos** (breaking cognitive frameworks), **redundancy** (overlapping of information for potential command), **requisite variety** (flexible organization structure and/or personnel rotation), as well as love, **care**, trust and commitment. (Nonaka, Toyama & Konno 2000, pp.25–29)

2.2.4 Summary

Within Nonaka’s paradigm of knowledge-based management, neither knowledge is seen as an objective, controllable resource nor is the organizational handling of knowledge treated as a separate domain of (knowledge) management. Rather the handling and creation of knowledge – with all its subjective and dynamic dimensions – is seen as the essential basis for all corporate activities. Management is given the role to establish **infrastructures** of knowledge enablers, such as value-guided vision, dialogue, or social practices, that build certain **ba’s** for interaction as the source of knowledge emergence.

Nonaka’s theoretical framework has been repeatedly discussed. Glisby and Holden (2003) argued that his model was strongly embedded within the Japanese culture and could not be transferred to Western companies. Schreyögg and Geiger (2003) criticized Nonaka’s classification and interpretation of implicit knowledge and the assumption that it could be

externalized. However, these critiques obviously evolve from a Cartesian view of rational distinction and do not recognize the universal dimension which Nonaka calls the 'both-and' view, in contrast to 'either-or' (Nonaka & Peltokorpi 2006, p.79).

This dissertation paper follows Gueldenberg & Helting (2007), who acknowledge Nonaka's framework as powerful starting point for a comprehensive and deep understanding of knowledge and knowledge management. In their view, the obvious theoretical weaknesses of Nonaka's model could be reduced through diligent and committed interdisciplinary work which then led to a more refined, interdisciplinary approach (Gueldenberg & Helting 2007, p.102,120). They appreciate it for taking into account the roots of knowledge and for tracing back the process of knowledge creation to a pre-theoretical, pre-propositional shared nexus of meaning in which human beings inevitably always dwell: the tacit dimension. (Gueldenberg & Helting 2007, pp.117–118) Further and refined discussion on the tacit dimension will be presented in chapter 3.1.2. It will lead to a slight re-interpretation of Nonaka's SECI process which will then form the basis for understanding the nature of self-transcending knowledge.

3 Knowledge, Learning and Cognition

3.1 The Notion of Knowledge

The notion of knowledge has been actively discussed at least since Socrates conceptualized it as 'justified true belief'. With the rise of knowledge as economic factor, an extensive discussion on the definition of knowledge has also started within knowledge management. Due to the complex, ambiguous and vague nature of knowledge, the discussion has not yet resulted in a consistent understanding. (Faucher et al. 2008, p.3)

Nonaka and Peltokorpi (2006) give an overview on different positions and discussions on the nature of knowledge, eg. taxonomies of knowledge versus holistic nature of knowledge, linkages between different taxonomies, the extent of differentiation between explicit and tacit knowledge, and discrepancies concerning the sources of knowledge (Nonaka & Peltokorpi 2006, pp.75–76)

The following sections will outline the understanding of knowledge which is used within the scope of this dissertation. It follows Davenport and Prusak who state wisely: "Since epistemologists spend their lives trying to understand what it means to know something, we will not pretend to provide a definitive account ourselves. What we offer is a working definition of knowledge, a pragmatic description that helps us communicate what we mean when we talk about knowledge." (Davenport & Prusak 1998, p.4)

Epistemology as a philosophical discipline considers questions of how we acquire knowledge and how reliable and "true" that knowledge might be. One of the essential questions, the question of how the acquired knowledge relates to reality, touches questions of ontology. This branch of philosophy is concerned with the nature of "reality" or what exists independent of its observation. For research work on any kind of knowledge itself, the underlying epistemological approach is of particular, since dual importance. It describes not only the philosophy of science, i.e. the philosophical background of how the researcher comes to know but also builds the theoretical background for the content work of his research.

3.1.1 Knowledge as Knower-related, Dynamic Construction

Constructivist Epistemology

In traditional epistemology, mainly known as realism, the world is seen as pre-given and pre-structured. The world is an “objective”, ontological reality, which need to be explored and discovered. Our senses function as transmitters whereby aspects of this reality can be transferred into the mind. Thus, knowledge is seen as a representation that reflects and maps a reality outside the mind. In a representationistic view, knowledge is *about* the world. The conception of truth is tied to the notion of objective validity. Truth warrants are sense-data and experiential results. (Glaserfeld 1984, pp.19–20; Spender & Scherer 2007, p.19) This corresponds with an ontological paradigm of scientific inquiry implying a one-way process of communication from an unvarying and disinterested object to an intelligent and interested observer. It detaches observers from and makes them intellectually superior to the objects they describe. (Krippendorff 1984, p.23)

The issue with traditional epistemology is that sense-data can never be validated for truth as it is impossible to compare the perception of an object with the object itself. Moreover, this epistemological view offers no possibility to understand cognition itself: Mapping cognitive activities (as object, i.e. something outside) through cognitive activities (as perception, i.e. something inside) leads into an unsolvable dilemma. These and similar thoughts led to opposite extremes to realism: notions around subjectivism, skepticism and solipsism, denying any world at all apart from the conceiving mind of the subject. (Maturana & Varela 1987, pp.133–134; Glaserfeld 1984, p.38; Glaserfeld 1985, pp.12–13)

Radical constructivism as represented by Glaserfeld, von Foerster, Maturana and Varela, occupies a **middle ground between realism and subjectivism**. As an epistemology it distances itself from subjectivism by allowing a world external to the mind (the realist’s reality) to act as a constraint. At the same time it also distances itself from realism, denying the possibility of ever knowing the essence of what constraints human agency or stands behind our perceptions. “Radical constructivism slides from being an epistemology of mind and towards being an epistemology of practice, on the one hand dealing with the agentic practice of constructing all that is knowable and on the other experiencing the unknowable as constraining what can be imagined.”(Spender & Scherer 2007, pp.20–21)

Reality as Described Distinctions of an Observer

Maturana and Varela (1980) first cut the Gordian knot of the dilemma between realism and subjectivism by introducing the **concept of the observer**. In doing this they moved away from the oppositions and changed the nature of the question, embracing a broader context:

They describe a living cognitive system as a unit of interaction that exists in an ambience and is organized in a self-referring circular organization (autopoietic organization). (Maturana & Varela 1980, p.9) This organization defines a domain of interactions in which the system can act with relevance to the maintenance of itself, and the process of cognition is the actual (inductive) acting or behaving in this domain. (Maturana & Varela 1980, p.13) The system becomes an observer when it generates discourse as a domain of interactions with representations of communicative descriptions: “If an organism can generate a communicative description and then interact with its own state of activity that represents this description, generating another such description that orients towards this representation ..., the process can in principle be carried on in a potentially infinite recursive manner, and the organism becomes an observer.”(Maturana & Varela 1980, p.29)

Observers can distinct unities from its background and see a unity in two different domains: in the domain where its components operate, i.e. in the domain of its internal states and dynamics as well as in the domain where it interacts with its environment and describes its history of interactions with it. Within the first domain the environment is irrelevant, does not exist. Within the second domain, where the observer can establish relations between certain features of the environment and the behavior of the unity, the internal dynamics of that unity are irrelevant. When we become aware of these two perspectives and relate them in a broader realm that we establish, epistemological complications vanish. We do neither need to fall back on representations nor deny that the system operates in an environment that is familiar owing to its history of structural coupling. (Maturana & Varela 1987, pp.135–136)

Through orienting interactions with other, similar, systems and with itself, both a consensual linguistic domain and a **domain of self-consciousness (through self-observation)** are generated. (Maturana & Varela 1980, p.48) Reality as a universe of independent entities about which we can talk is a fiction of the purely descriptive domain - the things arise in this

description. Hence, the question 'What is the object of knowledge?' becomes meaningless as there is no object of knowledge. **To know is to be able to operate adequately and effectively in an individual or cooperative situation.** (Maturana & Varela 1980, pp.52–53) Maturana and Varela summarize this in their key saying "All doing is knowing, and all knowing is doing." (Maturana & Varela 1987, p.26) Reality and cognition are not independent but interrelated.

Our instrument for cognition is language and the distinctive way of being human is "to be in language": as every reflection and self-observation takes place in language, language is the condition for the existence of an observer. Maturana and Varela summarize this in their second key saying: "Anything said is said by an observer"(Maturana & Varela 1980, p.8).

Implications for a philosophy of science are portrayed by Krippendorff (1984). Applying transformative processes of circularity to observation itself produces a shift in the paradigm of scientific inquiry from ontology to epistemology. Regarding the communication between the observers and the observed to flow both ways has the consequence that the properties of observers enter their domain of observation and render the established standards of objectivity and replicability unachievable. (Krippendorff 1984, p.23) "While ontological commitments assign scientific observers the role of discoverers of facts that are unalterably outside themselves, the emerging epistemology for communication assigns such observers the role of co-creators of facts."(Krippendorff 1984, p.27)

For Krippendorff "the drawing of distinctions" and "the formulation of relations" are two creative acts of an observer that are embodied in observers and their environment and form the basic epistemological unity of observation. In a circular sequence they manifest cognition, and the state toward which the process converges could be called understanding. "**Making sense** is a circular cognitive process that may start with some initially incomprehensible sensation, which then proceeds to imagining hypothetical contexts for it and goes around a **hermeneutic circle** during which features are distinguished – in both contexts and what is to be made sense of - and meanings are constructed until this process has **converged to a sufficiently coherent understanding.**" (Krippendorff 1989, p.13) "At that point observers are in harmony with what they believe they observe. The nervous system is organized or organizes itself such that it computes a stable reality. This reality is located neither inside nor outside the observing organism but resides in the ongoing process of

drawing distinctions and formulating relations. In this process ‘facts’ may come into being.” (Krippendorff 1984, pp.27–28)

Knowledge as Key That Fits Reality

The main point in which radical constructivism differs radically from traditional epistemology is in the **relation of knowledge and reality**. Whereas in the traditional view that relation is seen as a kind of correspondence or match, radical constructivism sees it as an adaptation in the functional sense. When we say that something matches reality we think of an equivalence of relations, sequence, or characteristic structure. On the other hand, if we say that something fits, we have in mind a different relation, such as a key that fits to open a lock. The fit describes a capacity of the key, not of the lock. (Glaserfeld 1984, pp.20–21)

Glaserfeld explains the concept of **functional fitness** by the analogy of Darwin’s theories of evolution where survival is the only criterion for the selection of species. There are only two possibilities: either a species fits its environment (including the other species), or it does not; i.e. it either survives, or it dies out. The notion that something could be fitter than fit or even the fittest makes no sense. This relation between viable biological structures and their environment coincides with the relation between viable cognitive structures and the experiential world of the thinking subject. Both fit – the first because natural constraints and accident has shaped them that way, the second because human intention has formed them: In the light of further experience, regularities and theories either prove themselves reliable or they do not. (Glaserfeld 1984, p.22)

Respectively, the mechanism of adaptation need to be understood in a different way: “In the history of knowledge, as in the theory of evolution, people have spoken of ‘adaptation’ and, in doing so, a colossal misunderstanding was generated. If we take seriously the evolutionary thinking, it could never be organisms or ideas that adapt to reality, but it is always reality which, by limiting what is possible, inexorably annihilates what is not fit to live.” (Glaserfeld 1984, p.22) Accordingly, the adaptive fit of knowledge must never be interpreted as a correspondence or homomorphism. (Glaserfeld 1984, p.24)

The epistemological aspect of the principle of constraints is that our knowledge is useful, relevant, viable, if it stands up to experience and enables us to make predictions and to bring

about or avoid, certain phenomena (i.e. appearances, events, experiences). If knowledge does not serve that purpose, it becomes questionable, unreliable and useless. However, if it proves as useful and viable, this does not mean that it hints at how the “objective” world might be. It merely means that we know *one* viable way to a goal that we have chosen under specific circumstances in our experiential world. (Glaserfeld 1984, p.23) Human activity of knowing cannot lead to a certain and true picture of the world but only to conjectural interpretation. That activity can be viewed as the creating of keys with whose help man unlocks paths towards the goals he chooses. These goals arise for no other reason than this: a cognitive organism evaluates its experiences, and tends to repeat certain ones and to avoid others. (Glaserfeld 1984, pp.31–32)

Given that the raw material of the experiential world is sufficiently rich, an assimilating consciousness can construct regularities and order even in a chaotic world. The extent to which that will succeed depends far more on the goals and the already-constructed starting points than on what might be given in a so-called “reality”. By comparison a consciousness determines what is to be categorized as “existing” unitary objects and what as relationships between them. Through these determinations, the experiencing consciousness creates **structure in the flow of its experience**. And that structure is what conscious cognitive organisms experience as “**reality**”. (Glaserfeld 1984, pp.36–37) The constructed world is an experiential world that consists of experiences and makes no claim about “truth”. (Glaserfeld 1984, p.29) Knowledge originates as the product of an active subject’s activity. (Glaserfeld 1984, p.31)

Radical constructivism, thus, is radical because it breaks with convention and develops a theory of knowledge in which knowledge does not reflect an “objective” ontological reality, but exclusively an ordering and organization of a world constituted by our experience. (Glaserfeld 1984, p.24) It is the operating, i.e. knowledge building of a cognitive entity which organizes its experiential world by organizing itself. Epistemology thus becomes the study of how the mind operates and how this developed, bringing in psychological and biological considerations. Both distinguish constructivism from realism which avoids any psychological or biological consideration as these are seen to adulterate a theory of knowledge. (Glaserfeld 1984, p.31)

Knowing is no longer understood as the search for an iconic representation of ontological reality but as a search for **fitting ways of behaving and thinking**. The traditional epistemological problem, seeking to know what is beyond experience, disappears. Knowledge can now be seen as something which the organism builds up in the attempt to order the as such amorphous flow of experience by establishing repeatable experiences and relatively reliable relations between them. The possibilities of constructing such an order are determined and perpetually constrained by the preceding steps in the construction. That means that the “real” world manifests itself exclusively there where our constructions break down. (Glaserfeld 1984, p.39)

“We build our world for the most part unawares, simply because we do not know how we do it. That ignorance is quite unnecessary. Radical constructivism maintains that the operations by means of which we assemble our experiential world can be explored, and that an awareness of this operating can help us do it differently and, perhaps better.” (Glaserfeld 1984, p.18)

‘Justified True Belief’

As shown above, constructivist epistemology proposes a subjective and dynamic view on knowledge. Without explicitly following constructivist ideas, it has been Nonaka who pioneered and established a subjective, context-dependent and value-based view on knowledge within knowledge management. “To understand knowledge, we must first understand the human beings and the interactive process from which knowledge emerges”. (Nonaka et al. 2008, p.7)

He distances from the positivistic epistemology of absolute, static and non-human truth. Instead, he stresses the relative, dynamic and humanistic dimension of knowledge: “[...] ‘truth’, ‘goodness’ and ‘beauty’ are in the eye of the beholder [...] **there are no whole truths; all truths are half-truths.**” (Nonaka, Toyama & Konno 2000, p.7) ‘Truth’ “differs according to who we are (values) and from where we look at it (context)”, so “knowledge cannot exist without human subjectivities and the contexts that surround human beings.” (Nonaka & Toyama 2005, p.421) The status of ‘truth’ is that “it relates to justified beliefs, corresponds to pragmatist epistemology, and results from processes where people individually and collectively justify beliefs” (Nonaka & von Krogh 2009, p.640). Correspondingly, within

Nonaka's theory, he considers knowledge as "a dynamic human process of justifying personal belief **toward** the 'truth' " (Nonaka, Toyama & Konno 2000, p.7, highlighted by author)

Knowledge has a subjective nature represented by such terms as 'commitment' and 'belief' that is deeply rooted in individuals' value systems. (Nonaka, Toyama & Konno 2000, p.7) Knowledge requires value judgment to be knowledge, therefore reality does not have 'objective' existence. (Nonaka et al. 2008, pp.8–9) Then adopting the traditional definition of knowledge as 'justified true belief', Nonaka understands it in a sense that individuals justify the truthfulness of their observations based on their unique viewpoints, personal sensibility and experience. Thus, the **focus is rather on the 'justified' than on the 'true' aspect of belief**. (Nonaka et al. 2006, p.1181; Nonaka, Toyama & Konno 2000, p.7) In this sense, there can neither exist anything like an objective truth nor knower-independent, objective, explicit knowledge.

3.1.2 Explicitness of Knowledge as Representation in Focal Awareness

Being the basis for Nonaka's prominent SECI model, the distinction between tacit and explicit knowledge has massively influenced the understanding of knowledge within knowledge management. "Highly derivative of, but not completely true to" (Snowden 2000, p.51) Polanyi's ideas, Nonaka defined explicit knowledge as knowledge that can be expressed in formal, systematic language and be shared in the form of data, formulae, manuals etc. while tacit knowledge is defined as personal knowledge embedded in individual experience that involves intangible factors such as personal beliefs, perspectives and value systems. Due to its very nature it is hard to articulate with formal language and 'indwells' in a comprehensive cognizance of the human mind and body. (Nonaka & Takeuchi 1995, p.viii; Nonaka, Toyama & Konno 2000, p.7)

While Polanyi saw tacit and explicit as different but inseparable aspects of knowledge, business and consultancy used the SECI model de facto as dualistic, rather than dialectical. Nonaka attempted to restate his more holistic and dialectical view of tacit and explicit knowledge when he introduced the concept of ba, but by this time the dualistic usage was too well established. (Snowden 2002, p.101) Also knowledge management literature -

mostly based on a positivist epistemology - has widely understood the implicit-explicit distinction as ontological classification. This resulted in massive efforts to explore means of externalization that could convert the new precious but elusive type of knowledge - tacit knowledge - into a well-known and controllable type of knowledge - explicit knowledge - to make it usable for organizational value creation. (Snowden 2000, p.51) However, looking closer at the philosophical roots of this distinction and the deeper ground of Nonaka's thoughts, it becomes evident, that these efforts have been – and are - rather misleading and cannot turn out to be fruitful (Snowden 2000, pp.51–52). We need to understand this distinction and the tacit dimension in a profound different way which is – as we will see – rather consistent with a constructivist epistemology.

Virtanen (2013) argues that the main point of Polanyi's epistemology was that the **tacit dimension** is not a separate category of knowledge but an **integral part of all knowledge**. Knowing requires active participation of a knowing subject, thus knowledge could never be objective or fully justified. Any expression of knowledge can only be a "sending" of messages in some form, which another knowing mind need to assimilate, understand and incorporate into its own knowledge structures. "Despite the various ways to codify and store 'knowledge', stored knowledge does not seem to have much meaning until it is used for some purpose (by someone). When we know something, we engage in that what we know and cannot be neutral or indifferent in relation to it". (Virtanen 2013, p.122)

Virtanen finds in Polanyi's theory, that tacit and explicit knowledge are not classifications but are related to two different kinds of awareness - **subsidiary awareness and focal awareness** - which form a tacit-explicit structure inherent to all acts of knowing: "The things that we are attending to and that we are consciously aware of (e.g. propositional belief, mental image, external object, read sentence etc.) belong to focal awareness. However, all focal awareness is dependent on subsidiary awareness that consists of variety of clues, elements and processes (personal knowledge structures, emotional processes, past experiences, motor responses etc.) that enable focal awareness giving rise to the personal meaning of its contents. [...] Hence, the focal object is always identifiable and in this sense explicit, whereas subsidiary content is unidentifiable, tacit. In addition, the two kinds of awareness are mutually exclusive; when the attention is switched to something hitherto subsidiary, it becomes focal losing its subsidiary meaning." (Virtanen 2013, p.120)

Correspondingly, Tsoukas highlights that “no knowledge is possible without the integration of the subsidiaries to the focal target by a person”. (Tsoukas 2005b, pp.146–147) All knowledge is personal and all knowledge is action in the sense that it requires the act of a knower who links the particulars to the focal. “The relation of a subsidiary to a focus is formed by the act of a person who integrates one to another”. (Polanyi cited in Tsoukas 2000, p.107) As depicted in figure 3.1, tacit knowledge forms a triangle with subsidiary particulars, the focal target, and the knower who links the two.

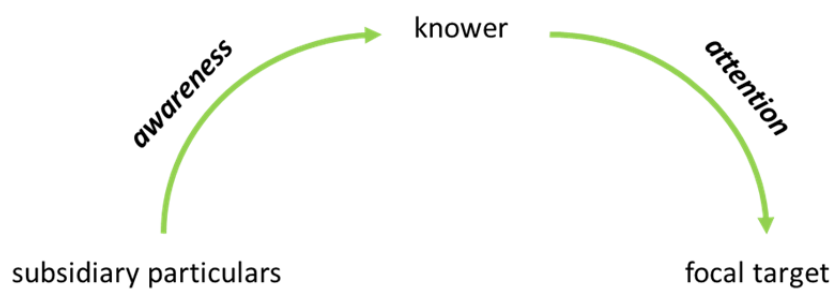


Fig. 3.1: Personal Dimension of All Knowledge (Tsoukas 2005b, p.147)

“Tacit knowledge can be formalized and explicitly communicated *if* we focus our attention on it. And vice versa: explicit knowledge [...] is *always* grounded on a tacit component. Tacit knowledge and explicit knowledge are two sides of the same coin – being mutually constituted, they cannot ‘interact’, nor can they be ‘converted’ into one another. [...] There is **no conversion of tacit knowledge to explicit, but a shift of attention from focal awareness to subsidiary awareness.**” (Tsoukas 2005d, p.386)

An explicit form of presentation, e.g. a note on a paper, has a tacit dimension while the conscious representation forms the explicit dimension, equally whether we read it, hear it or come to think it by ourselves. **Explicitness of knowledge** does not refer to the form of presentation but to the **clarity of representation in our mind**, which again is not dependent on the form of presentation but on the origin and justifiability of the belief in question. The knower forms a focal conception of the matter, which represents more or less explicit knowledge, as a result of tacit factors. Thus, all knowledge has a tacit part upon which the possible explicit part is founded. (Virtanen 2013, p.123)

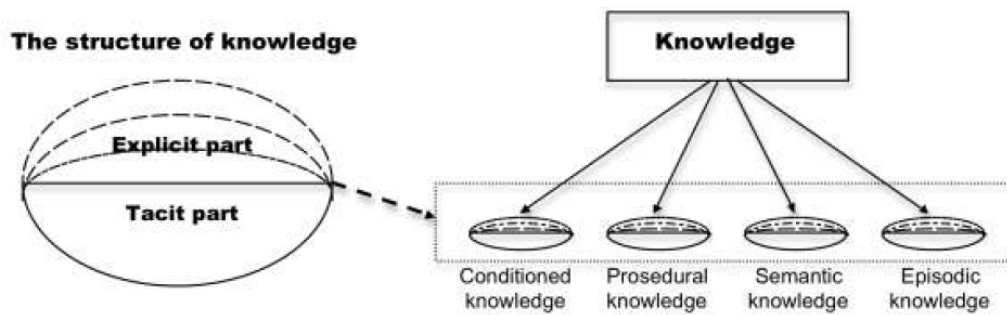


Fig. 3.2: Structure of Knowledge and Categories of Knowledge (Virtanen 2013, p.123)

The image illustrating Virtanen's thoughts (Fig. 3.2) strongly reminds of Polanyi's iceberg metaphor. The part below the waterline cannot be converted into a part above the line as these are not two types of ice, but one piece of ice which is more or less visible, i.e. more or less in focus.

Although Nonaka's model denominates the distinction between tacit and explicit knowledge as ontological and centers around the idea of explication of tacit knowledge, Nonaka's understandings of knowledge and knowledge creation rather fit into the considerations above. "Tacit and explicit knowledge do not exist separately, but rather, like the visible and submerged portions of an iceberg, form a continuum. [...] The term 'conversion' might be misunderstood as implying that knowledge is a substance that can be processed in the way as physical resources." (Nonaka et al. 2008, pp.18–19)

Nonaka's knowledge-creating process of dialogue and practice may be better understood to help switch the attention, i.e. the focal awareness, and as a result may form new focal beliefs or clarify existing ones. Also it may enable the expression and presentation of some knowledge in an explicit form, however, this knowledge has still got a tacit and subjective dimension as it is still known by subjects. Nonaka himself maintains that "explicit knowledge without tacit insight quickly loses its meaning. Written speech is possible only after internal speech is well developed" (Nonaka, Toyama & Konno 2000, p.8)

Also referring to Polanyi, Gueldenberg and Helting understand the tacit dimension in a similar way, in terms of a field which provides the **fertile ground for phenomena to emerge** (Gueldenberg & Helting 2007, p.118). They argue that within this frame the SECI process

could be understood as a process in which propositional knowledge is abstracted from a tacitly understood, lived, shared pre-propositional field of meaning so that explicit and tacit knowledge are not separate, but rather interrelate (Gueldenberg & Helting 2007, p.118).

Within this abstraction process, justification plays an important role. According to Virtanen, the “**justification toward the truth**” has one tacit and one explicit dimension. While Nonaka concentrates on a form of external justification through interactive, dialectical dialogue and practice meant to convert individual ‘tacit’ type of knowledge into ‘explicit’ type of knowledge, Virtanen goes deeper into Polanyi’s analysis of belief forming factors and suggests a second type of justification: internal justification which refers to the tacit belief forming factors. “Tacit knowledge can be understood as an internal justification for the focal belief. [...] natural cognitive and physiological processes involved in the process of knowing refer to internal justification of the formed belief and cannot be bypassed in an analysis of knowledge.” (Virtanen 2013, p.124)

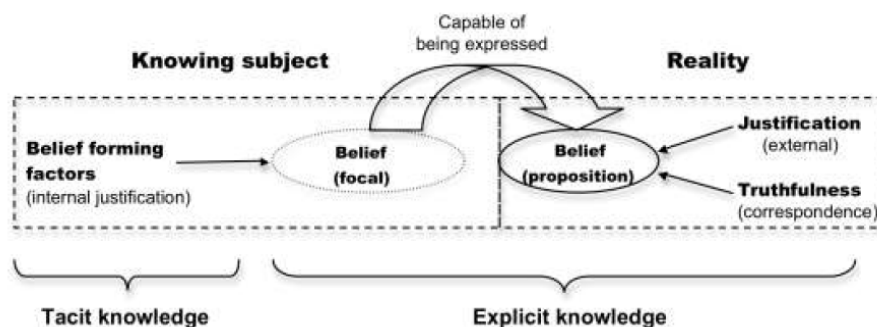


Fig. 3.3: Traditional ‘Reality’ and Polanyi’s ‘Knowing Subject’ (Virtanen 2013, p.124)

To summarize, there is always a tacit dimension in all knowledge. Switch of focus in attention may bring hitherto subsidiary elements to focal awareness, but again this is then still embedded in tacit knowledge structure. By definition, the tacit dimension is inarticulate and inaccessible. Instead of talking of conversion or explication of tacit knowledge Virtanen therefore suggests discussing **crystallization of (focal) knowledge** that is difficult to articulate. (Virtanen 2013, p.125)

Evidently, the key to crystallization or abstraction of such focal or propositional knowledge are processes around awareness, attention and consciousness. Davenport and Völpel (2001)

recognized that **human attention is the currency of future business** and at the same time already the scarcest resource in many organizations. Knowledge management needs to rise to attention management as even the highest-value knowledge is of little use unless someone can attend to it. Davenport and Voelpel predict that “One of the key battlegrounds in the future knowledge war will be the management of attention: understanding how it is allocated by individuals and organizations, knowing how to capture it more effectively for important information and knowledge.” (Davenport & Voelpel 2001, p.218) Scharmer’s awareness-based Theory U (chapter 2.1.4) including the concept of self-transcending knowledge is one of the pioneering works into this direction.

3.1.3 Social Embeddedness of Knowledge

Constructivist epistemology that denied the existence of knowledge as an object and assigned an active “knowledge co-creator role” to agents, then consequently turned the attention to the source of knowledge. Within constructivism, a variety of more or less divergent forms have developed, which can be distinguished according to their position on personal versus social construction of knowledge. (Geelan 1997, p.15)

As an early bird of constructivism, Glasersfeld had a focus on the individual construction of knowledge, nevertheless leaving room for social interaction. Maturana and Varela have more explicitly stated that they understand building knowledge as a social phenomenon: “It is by languaging that the act of knowing, in the behavioral coordination which is language, brings forth a world. We work out our lives in a mutual linguistic coupling, not because language permits us to reveal ourselves but because we are constituted in language in a continuous becoming that we bring forth with others.” (Maturana & Varela 1987, pp.234–235) Kakiyama and Sorensen summarize Maturana and Varela as follows: “Knowledge is a result of human mental acts, be it individual, group, or social, and those acts are dependent on various socio-cultural contexts. At the same time, mental acts, along with linguistic acts, continuously shape social reality and can induce new contextual drifts of the world.” (Kakiyama & Sorensen 2002, p.4)

This **social, process-centered view of knowledge** that focuses on individuals in a social context, assumes that knowledge is a social construct being created in social interactions.

(Jakubik 2007, p.14) Within philosophy, related questions are investigated under the term **social epistemology**. There, as well as within the context of knowledge management, a variety of positions have developed, with considerable fluidity among them:

Following a “**cognitivist epistemology**”, the role of social context and relationships is restricted to having “social effects” on a knowledge construction taking place in the individual mind. Social context has an influence on individual creation of knowledge structures and mental models, nevertheless the latter remain private. (Geelan 1997; Talja et al. 2005)

Following a “**connectionist epistemology**” means to switch to a community or collectivist view where knowledge does not reside in each individual brain but rather, it is in a system of interconnected people. (Jakubik 2007, p.17) Kakihara and Sorensen argue that, when knowledge is dependent on human intersubjective interpretation than knowledge does not exist in isolation from the social environment; rather it is **embedded in the social fabric of human interaction and emerges out of ongoing complex human interactions** with other actors. (Kakihara & Sorensen 2002, p.6).

The **connectionist epistemology** goes beyond a pure context-sensitive notion of knowledge. Knowledge is not only held by individuals, but is also expressed in regularities or organizing principles by which members cooperate in a social community. (Marr et al. 2003, p.774) Such an extreme ‘social’ position is taken by Gergen (1999). Distinguishing it from “social constructivism” he proposes a view which he calls ‘**social constructionism**’. It suggests that knowledge does not arise or reside within cognizing individuals or within the natural world nor within organizational systems and structures but within ‘**discourse communities**’ - within conversations and interactions between people. The consensus processes of language-use and meaning-making are seen as social in character and constitute all of knowledge. As the most potent metaphor for understanding knowledge and language, Geelan suggests that of ‘**dialogue**’. (Geelan 1997, p.18; Easterby-Smith et al. 2000, p.787) Production of knowledge is located in ongoing conversations. Knowledge and identities are constructed in discourses that categorize the world and bring phenomena into sight. (Talja et al. 2005, p.82) Within the organizational learning debate, this social constructionist perspective was recognized as a shift from an ‘epistemology of possession’ to an ‘epistemology of practice’. (Easterby-Smith et al. 2000, p.788)

Applying constructivism to itself, we can assume that there is not “one true way” of constructivism but each of the perspectives has a certain focus to serve a certain goal. Geegan (1997, p.15), Spender and Scherer (2007, p.24), Jabukik (2007, pp.16–17) and other, favor epistemological pluralism to hold a dialectical tension and to acknowledge the possibility of several kinds of human knowledge.

In view of the research question at hand, which refers to collective construction of a certain kind of knowledge that transcends the individual, the connectionist epistemology seems to offer promising ground for investigation. The certain kind of knowledge under investigation seems to emerge within a web of interactions, within the relationships itself and is not privately owned by the individuals but owned by the entity made up by these regularities: a group, a team, an organization. The specific kinds of relating and interacting that are generative for the construction of this knowledge - be it conversation, discourse or any other forms of (inter-)action - will be explored as the exact topic of this research.

It is one of the main accounts of Nonaka’s knowledge creating theory that the source of **knowledge creation is social interaction**. “The most prominent feature of knowledge, compared with physical resources and information, is that it is born of human interaction.” (Nonaka et al. 2008, p.7) Knowledge is born of the multiple perspectives of human interaction which - viewed together - approach an understanding of the essence (or ‘truth’) of the whole phenomenon. Thus, the knowledge-creating-process is a social process of validating ‘truth’, through synthesis of differing views held by a variety of people. (Nonaka et al. 2008, p.12) Put differently, the **social process of negotiating** a synthesis of differing views functions as a “truth warrant” (Spender & Scherer 2007, p.19).

Following a philosophical view of „panta rhei“ - all is in flux – Nonaka and his associates see existence as well as knowledge as a continuous flow. Human beings exist, or come into being, as an integrated process in the world through their knowledge-creating interactions with that world. (Nonaka et al. 2008, p.10) Knowledge is a dynamic human process in which individuals interact, thus changing themselves, others and their environment. “Creativity plays a role in the relationship between human beings and the world.” (Nonaka et al. 2008, p.11)

Following a **complexity-based view**, Stacey (2000) goes beyond the pure context-sensitive view and offers an extended contextual, connectionist perspective on knowledge creation

called 'complex responsive processes of relating'. Similar to Nonaka, Stacey sees knowledge as continuously reproduced and transformed within interaction between people. He argues that people cannot "share" knowledge, because one cannot share the actions of relating to others, but only perform them. (Stacey 2000, p.23) Knowledge resides within a variety of contextual factors that are inseparably connected with the body of knowledge. Knowledge thus can be seen as an **interconnected web of relationships** in which human interpretative acts ceaselessly shape and maintain, both intentionally and unintentionally, the relational setting of the web and contextual disposition of the social reality. Any knowledge always depends on a set of relationships to other knowledge in the framework of the whole social reality. (Stacey 2000, p.37)

3.1.4 Enabling the Emergence of Knowledge

The Concept of Emergence

When knowledge is not understood as a static, passive and objective unit which can be shared, converted and transferred, but instead viewed as a dynamic, (inter-)active and subjective continuous flow, all kind of knowledge seems to be somehow new: It continuously changes and is newly created within each particular situation.

In theorizing these dynamic processes of knowledge creation, there is one concept of development which is predominantly and recurrently being adopted: the concept of emergence. To name only a few, Nonaka speaks of an "interactive process from which knowledge emerges" (Nonaka et al. 2008, p.7), Smedlund of "emergent potential knowledge" (Smedlund 2008, p.63), Gueldenberg and Helting of "phenomena to emerge" from the tacit dimension" (Gueldenberg & Helting 2007, p.118), Peschl and Fundneider understand new knowledge "as an emergent phenomenon" (Peschl & Fundneider 2008b, p.16) and Stacey describes the "Emergence of Knowledge in Organizations" as a "complex responsive process of relating" (Stacey 2000, p.23).

Moreover, also fields surrounding the notion of knowledge are often being related to the concept of emergence, very likely due to the fact that knowledge plays one or another active role in it. Within the last chapters we have come across emergent strategies (Mintzberg), emergent realities (Teece), emerging wholes (Senge), emerging futures, complexities and

opportunities (Scharmer), emerging resp. emergent innovation (Nonaka, Peschl), emerging relationships and ba's (Nonaka), emergent learning processes (Kolb), emerging epistemologies (Krippendorff).

It seems that emergence offers an attractive concept to describe phenomena around knowledge processes. However, in most cases it has been left out to explore the concept and its roots more deeply in order to retrieve transferable insights for the understanding of knowledge processes. So, if emergence is an essential attribute of knowledge, what does it hold exactly?

Although the concept of emergence is over 100 years old, there is no standard definition currently available in the literature and it is still not clear what the term denotes or how emergence emerges. (Boschetti et al. 2005, p.573; Corning 2012, p.301) Common use links it to ideas such as 'the whole is greater than the sum of its parts' or 'the transformation of quantity into quality'. One definition that has been appreciated as one of the most elaborate ones had been given by Goldstein: "Emergence refers to the **arising of novel and coherent structures, patterns and properties during the process of self-organization in complex systems**. Emergent phenomena are conceptualized as occurring on the macro level, in contrast to the micro-level components and processes out of which they arise." (Goldstein 1999, p.49) In other words, emergence means that some system displays new qualities on the macro level which cannot be found in its components as these features emerge out of the interaction of the components. (Peschl & Fundneider 2008a, p.16)

The ideas behind the concept of emergence can be traced back to the times of the ancient Greeks, but the term "emergence" was coined at the end of the 19th century by philosopher G.H. Lewes. (Goldstein 1999, p.68; Hodgsons 2000, p.65) During the 1920ies and 1930ies, he was followed by the 'proto-emergentists', a group of philosophers, animal behaviorists and entomologists who set up various ideas on the **organic 'outspring of something that has hitherto not been in being' within parts-whole relationships**. However, lacking respective technologies they could not explain the process of emergence itself, i.e. the transformation process of lower-level inputs to the higher-level outputs. Thus, in times of prevailing positivism the concept of emergence was dismissed as useless. (Hodgsons 2000, p.66; Goldstein 1999, p.54)

The concept and its ideas were rediscovered and rehabilitated during the 2nd half of the 20th century. (Hodgsons 2000, p.69) One of the first authors was Polanyi who titled a chapter “Emergence” in his famous book on “The Tacit Dimension” Polanyi (1967):

“...you cannot derive a vocabulary from phonetics; you cannot derive the grammar of language from its vocabulary; a correct use of grammar does not account for good style; and a good style does not provide the content of a piece of prose. ... it is impossible to represent the organizing principles of a higher level by the laws governing its isolated particulars.”(Polanyi 1967, p.36)

Emergence as a scientific explanation made its way through the study of the dynamics in systems within physical and computer sciences. Early system sciences - such as cybernetics, information theory, general systems - investigated simple, linear, equilibrium seeking systems without explicit focus on emergent properties. (Goldstein 1999, pp.54–55) Then the development of chaos theory by the 1980ies and the following development of the complexity theory during the 1990ies opened the door for investigation of **complex, nonlinear, non-equilibrium systems that show emergent properties**. While chaos theory focuses on disorder and chaos - like the famous ‘butterfly effect’-, complexity theory focuses on the emergence of “order out of a chaos” and brought respectability and prominence to the concept of emergence, even in disciplines where it had been neglected. (Hodgsons 2000, p.71) Today, technological, mathematical and methodological progress in simulating systems interactions enables a complexity theory that can open the proto-emergentists’ black box, giving the process of emergence a much surer foundation and usefulness in scientific explanations, thus rendering it less opaque and, thereby less prone to the tag of “miraculous”. (Hodgsons 2000, p.54; Goldstein 1999, p.59)

Emergent phenomena seem to be ubiquitous in nature, social reality and organizations. We find them in any complex, evolving system throughout the natural and the social realm. (Goldstein 1999, p.69; Hodgsons 2000, p.75; Boschetti et al. 2005, p.573). “The human body possesses behaviours and functions which are not expressed by our individual cells; metals show properties not displayed by individual atoms; societies undergo dynamics which transcend individuals” (Boschetti & Gray 2013, p.2) A number of authors view the evolutionary process itself as an emergent phenomenon. (Corning 2012, p.296)

Although emergent phenomena appear differently in different types of systems, they have in common the following interrelated properties: (Goldstein 1999, p.49)

- (Radical) **Novelty** on macro level that is neither predictable nor reducible from micro-level components
- **Coherence** correlating separate lower-level components into a higher-level unity
- **Macro level** as locus of emergence
- **Dynamic** evolution over time
- **Ostensive showing**, each different to previous ones

Several different versions of emergence have developed which account for varying views concerning the correlation and causality within the parts-whole relationship, i.e. **reducibility and predictability** of macro-level phenomena or causation processes between both levels. **Weak versus strong** emergence, for example, differentiates cases where macro level phenomena are resp. are not reducible to micro-level components. (Stephan 1999) Stronger forms of emergence have been discussed under the term '**downward causation**', a weaker form has developed into the concept of '**supervenience**'. (Boschetti et al. 2005, pp.6–7; Hodgsons 2000, p.74)

The concept of emergence is applied in highly different scientific disciplines such as complexity theory, sociology and the philosophy of life and mind. (Neumann 2009, p.70) "Emergence is appealed to when the configuration of the components of a complex system offers more explanatory insight into the dynamics of the system than do explanations based on the parts alone. Emergence functions not so much as an explanation but rather as a descriptive term pointing to the patterns, structures, or properties that are exhibited on the macro-level. **Higher-level patterns represent an across-the-system correlation** not present on the lower level of system components. **Explanation** then elicits the special, higher-level laws, including determining the **conditions that prompt the emergence.**" (Goldstein 1999, pp.57–58) "Many powerful computer simulations of artificial social worlds showed the emergence of order and other 'higher-level' properties in complex systems. [...] A main thrust was considered to discover whether (and under what conditions) histories exhibit interesting emergent properties." (Hodgsons 2000, p.71) As emergence can be both constructive as well as destructive, it is essential to understand how to **channel the process of emergence in constructive directions.** (Goldstein 1999, p.68)

Obviously, it shows highly plausible to apply the concept of emergence to the notion of knowledge as they widely share common ground: dynamic construction via interaction, knower- resp. context-relatedness, transcendence into higher levels, rise of new, explicit/ostensive phenomena from a tacit/micro-level ground of components. However, one of the most striking traits of emergence is often neglected when applied within the context of knowledge: **non-linearity**, and therefore a certain extent of non-reducibility and – most important - non-predictability. Regardless of which view we take on emergence, weak or strong, in any case the output at the higher level – in this case new knowledge - is a result of a non-linear process and therefore cannot be predicted or determined, thus caused in a traditional sense. We rather need to investigate conditions which prompt emergence, resp. enable the emergence of knowledge.

Enabling as 3rd Generation Knowledge Management

It is widespread to claim that the nature of knowledge is such that it cannot or should not be managed. This is certainly true for an understanding of management as a bureaucratic command-and-control exercise in the sense of Taylorism or ‘scientific management’. (Snowden 2000, pp.50–51) But, concepts of management and knowledge management have evolved together with the understanding of knowledge, and obviously will further do. Several authors (eg. Snowden 2002; Smedlund 2008; Scharmer 2001) distinguish **three generations of knowledge management**: The focus on storage of explicit knowledge before 1995, the focus on the conversion between explicit and tacit knowledge initiated by Nonaka’s publication in 1995 and a third age which is said to arise nowadays.

What the third generation of knowledge management exactly will bring is still under discussion. Knowledge certainly needs to be ‘managed’, but the question is how, and what ‘management’ exactly will have to mean. For Smedlund, the third generation needs to focus on potential knowledge, i.e. on creating the right infrastructures to utilize ‘emerging bits and pieces of knowledge’ (Smedlund 2008, p.64). For Scharmer, the third phase of knowledge management means the focus on the (thought) conditions that allow processes and tacit knowledge to evolve in the first place. (Scharmer 2001, p.139) Snowden sees the space opening up for a new organic metaphor of management which is informed by complexity theory as it is realized that much knowledge is held collectively within communities, and

cannot be represented as the aggregation of individual knowledge (Snowden 2000, pp.52–53). “We need to shift from experts who analyze and interpret, to facilitators who through active discourse enable emergence of new understanding and perspective.” (Snowden 2000, p.63).

Three heuristics illustrate the change in thinking required to manage knowledge: (Snowden 2002, p.102)

- (1) **We can never know if someone is using his knowledge.** Knowledge can only be volunteered; it cannot be conscripted.
- (2) **Codification is time consuming.** We can always know more than we can tell, and we will always tell more than we can write down.
- (3) **Human knowledge is triggered by circumstances.** We have to recreate the context of people’s knowing if we want to enable knowledge use. We only know what we know when we need to know it.

“In the third generation we grow beyond managing knowledge as a thing to also managing knowledge as flow.” (Snowden 2002, p.101) Physicists had to accept that electrons are paradoxically both waves and particles, dependent on what you are looking for. Equally, Snowden suggests embracing paradox in knowledge management and understanding knowledge as both a thing and a flow requiring diverse management approaches. “In the second age we looked for things and in consequence found thing, in the third age we look for both in different ways and embrace the consequent paradox.” (Snowden 2002, p.102)

What all approaches for a third phase of knowledge management have in common is that they all **acknowledge the emergent character of knowledge**. They may resolve the conceptual conflict between knowledge and management which results from negligence of emergence as a fundamental aspect of knowledge. In general, conventional management theories lack the appreciation of the emergent properties of social and organizational systems in general and of knowledge intensive behaviors of actors in particular. Just as previous generations of knowledge management research have not sufficiently dealt with emergent properties as they largely rest on the representationistic understanding of knowledge. The contradiction between emergent knowledge and the issue of management should be overcome by actively addressing “knowledge emergence” issues in contemporary and future knowledge management research. (Kakihara & Sorensen 2002, p.54)

Acknowledgment of the emergent character of knowledge implies a **complexity-based attitude**: The focus is on providing conditions or infrastructures that **enable** an organic development of new knowledge without aspirations of determining it. A complexity-based approach does not provide a recipe book on how to create knowledge but identifies underlying principles that result in practices. (Snowden 2000, p.55) It investigates the manner in which certain **conditions** allow for the amplification of random events. (Goldstein 1999, p.56) While emergence seems to be the key concept for nowadays understanding of knowledge, **'enabling' seems to be the core principle of the third generation** of knowledge management. (Snowden 2000, p.54)

For Argyris and Schön, **enablers** are organizational structures that facilitate organizational inquiry, i.e. communication channels, IT systems, spatial environment, procedures and routines, incentive systems etc. Together with behavioral features they create the **conditions** under which individuals interact in organizational inquiry. (Argyris & Schön 1996, p.28)

However, when adopting a complexity-based attitude towards knowledge, this linear view need to be extended to a non-linear, systems view on enabling as portrayed by Peschl (eg. Peschl 2007a; Peschl & Fundneider 2011). In contrast to the attitude of making and controlling, the attitude of enabling surrenders to reality's unpredictable surprises. Enabling is about "facilitating a process of breaking forth of (new) latent qualities and dynamics, facilitating 'giving birth' to a new form, new knowledge" (Peschl & Fundneider 2011, p.46) Enabling means to give up the regime of control, determinism and making and instead "to provide a set of constraints or a facilitating framework supporting the process of bringing forth new knowledge" (Peschl & Fundneider 2011, p.45). Referring to systems theory, these constraints are compared to attractors and repellers which modulate the knowledge dynamics within a force field, while these dynamics themselves have an influence back on the framework of constraints. Thus, the knowledge creation space itself may change during knowledge processes and turn out to be highly dynamic and autonomous. (Peschl & Fundneider 2011, p.45) Peschl has conceptualized such knowledge creation space as **'Enabling Space'** (Peschl 2007a), i.e. "a space supporting, enabling and facilitating processes of innovation and knowledge creation" (Peschl & Fundneider 2011, p.48).

3.1.5 Non-linear Relationship between Data, Information, Knowledge, Wisdom

Within knowledge management, one of the most common ways to define knowledge is by distinguishing it from data and information (Nonaka 1994; North 1998; Davenport & Prusak 1998). Inherent to these distinctions is a kind of linear, hierarchical relationship: the lowest category 'data' needs semantics, meaningful patterns to become 'information' which again needs human context, experience and action to become 'knowledge'. (Davenport & Prusak 1998, pp.2–5; Willke 1998, p.11; North 1998) Adding qualities like sound judgment, supreme good values, and foresight, we arrive at the highest level of the knowledge hierarchy: wisdom (Matthews 1998; Nonaka & Toyama 2007; Rowley & Slack 2008).

Adopting a perspective of complexity theory, Faucher et al. (2008) propose a new, interesting model that moves away from those hierarchical relationships and theorizes how elements interact to form a feedback system. Interestingly, they found that the earliest recorded usage in English of each of the terms occurs in reverse order from the traditional knowledge hierarchy. Wisdom is the oldest and data the newest term. (Faucher et al. 2008, p.4)

Trying to capture the essence of various definitions within knowledge management literature they summarize the relationships between data, information, knowledge and wisdom in that the next higher level results from the lower level being “processed in some meaningful ways” (Faucher et al. 2008, p.5). This processing, the transformational relationship is identified as an increase of connectedness, as understanding. “Although this model does not show whether or how one can transition from wisdom to data, it has the advantage of providing an initial **holistic perspective by using the notion of connectedness**”.(Faucher et al. 2008, pp.7–8)

In order to be consistent with the idea of openness of complex adaptive systems, Faucher et al. add appropriate borders to the knowledge system: Existence - as the whole environment that humans can grasp and create data about - and enlightenment - as the highest form of understanding. Data, information, knowledge and wisdom are seen as cognitive constructs lying in between those two states of being. Showing that all constructs are finally based on abstractions from existence, they propose that the distinction among them follows an exponential function of abstraction and understanding. Data, information, knowledge,

wisdom, and enlightenment are all labels used to structure human understanding of the same construct: existence. They are transformations of existence. Together with existence they form a feedback system with positive and negative feedback loops. Such a non-linear appraisal finally is consistent with complexity theory. (Faucher et al. 2008, pp.8–10)

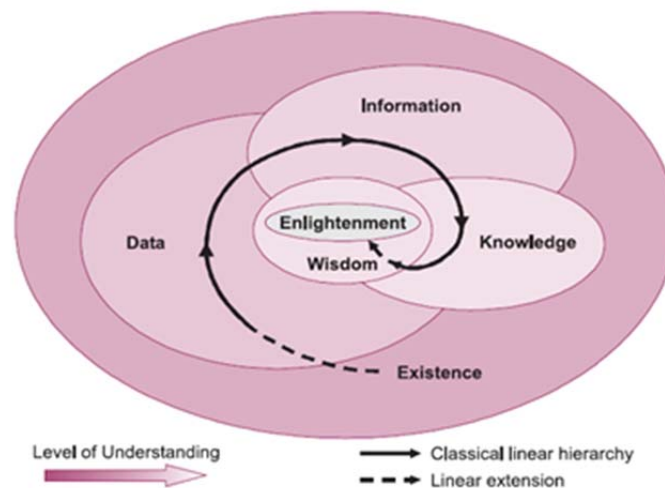


Fig. 3.4: Complexity-based View of the Knowledge System (Faucher et al. 2008, p.11)

“Existence, data, information, knowledge, wisdom, and enlightenment are all part of a cognitive system of knowledge. Cognition is the facilitation process through which the system functions; it is the process by which knowledge and understanding are developed.” (Faucher et al. 2008, p.11) Faucher et al. claim that there is **no hierarchy** among the elements and they do not need to be obtained in a specific order, but their appearance depends on the situation. The cognitive system of knowledge is a **social construct**, the result of the interaction between a cognitive base and its environment through its existence. Relating to the tacit dimension of knowledge Faucher et al. suppose that all elements could be tacit or explicit but the chance that elements become tacit increases with the level of understanding. (Faucher et al. 2008, pp.11–12)

Following the meaning of ‘meta’ according to the Oxford English dictionary as “connected with a change of position or state, higher, beyond”, Faucher et al. suggest that meta-knowledge/meta-information etc. is knowledge/information etc. associated with a change of state. It is at a higher state of development, situated beyond normal

knowledge/information, denominating the understanding of the conversion processes. Therefore, Faucher et al. consider the search for and understanding of the metas as the core of the concept of knowledge management. (Faucher et al. 2008, p.13)

3.1.6 Knowledge as Capacity to Act

Although there is largely consensus on the existence of the knowledge characteristics described in previous chapters, definitions of knowledge still show great disparity. (Faucher et al. 2008, p.5) For the scope of this dissertation we will follow a working definition developed by Churchman (1971), Argyris (1993) and Stehr (1996) who agree on knowledge as “capacity to act”. The working definition of knowledge as “capacity to act” offers a high compliance with the theories presented as foundations for this research, as well as with the characteristics of knowledge as presented before.

More than 40 years ago, already Churchman (1971) recognized that knowledge must be understood as an **agile force** - a **powerful potential** – that changes the world. He argued that knowledge cannot be found within a collection of information or data but it depends on a user doing something with it: “Knowledge resides in the user and not in the collection.” Therefore he first suggested the notion of knowledge to be understood as an action and potential action, as the human capacity for effective action, as capability of certain actions under certain circumstances. (Churchman 1971, p.9) Argyris (1978; 1993) then coined the notion of “actionable knowledge” as the practical knowledge that people use to create the world. As all human beings need to become competent in taking action and simultaneously reflecting on this to learn from it, human action must be placed in the context of knowing. Actionable knowledge informs us how to create or produce what we claim has high external validity. (Argyris & Schön 1978, p.10; 1993, p.1) Because knowledge is constructed through – and embedded within – action, it provides an internal determinant for subsequent actions, which in turn modify the internal knowledge of the individual. (Talja et al. 2005, p.86).

Stehr (1996; 2001) explains that he derived his definition as „capacity to act“ from Francis Bacon’s famous observation „**scientia est potentia**“. The more common translation as ‘knowledge is power’ would be somewhat misleading as Bacon rather meant that knowledge derives its utility from its capacity to set something in motion, its **potential to start**

something going. That kind of knowledge - scientific, technical or of other type - is privileged, which more than any other creates new opportunities for action. (Stehr 1996, p.6; Stehr 2001, pp.89–90)

Stehr sees a number of advantages in the definition as a capacity for action: it enables one to stress not merely one-sided but multifaceted consequences of knowledge for action. “The term capacity for action signals that knowledge may be left unused or may be employed for irrational ends. The definition of knowledge as a capacity for action indicates strongly that the material realization and implementation of knowledge is dependent on, or embedded within the context of specific social, economic and intellectual conditions. Knowledge, as a capacity for action, does not signal that specific knowledge claims always convey or carry a kind of constant and fixed ‘value’ “. (Stehr 1996, p.8)

3.1.7 Summary

Knowledge is **tied to the knower’s personal experience**, thus, there is no object of knowledge. Constructivism holds that knowledge acts as **servicing key** that is **co-constructed** in a dance-like cooperation between **knowing system and environment** to provide **fitting ways of behaving and thinking**. The fit describes the capacity of the key, not of the lock, thus knowledge does not stand for an objective truth but for a **subjective capacity to act** in certain situations. Knowledge derives its utility from its capacity to set things in motion. It cannot be shared, but only performed.

A strict categorization of knowledge seems to be impossible due to its **holistic and complex nature**. Rather than classifying data, information, knowledge and wisdom in a hierarchical manner, it seem to make more sense to see all constructs as (propositional) **abstractions from a** (pre-propositional, tacitly understood) **field of meaning and existence** that form a social cognitive system of knowledge and differ by degree of abstraction, understanding and connectedness. Equally, the **tacit dimension** is not a separate category of knowledge but an **integral part of all knowledge**. It serves as the fertile, subsidiary ground for phenomena to emerge. Explicit knowledge (understood as objective, codified) loses its meaning without tacit insight. So it may make more sense to **refer explicitness rather to the clarity of representation in the knower’s mind** than to the form of presentation.

To build this clarity, to turn belief into personally ‘true’ knowledge it requires judgments and justifications. Processes of **internal and external justification** forming a focus to view the world could be understood as an organization or construction of a world constituted by our experience, by former constructed rules and by our goals. As our experience is context-dependent and continuously changing, our knowledge is highly dynamic and in continuous flow. It is **embedded in the social fabric of human interaction and negotiation, an interconnected web of relationships**. Nonaka’s description of the knowledge-creating process as **dialectic synthesis** of multiple perspectives approaching an understanding of the essence shows similarities to Krippendorff’s definition of cognition and understanding as **circular sequence of drawing distinctions and formulating relations** converging to a sufficient status of sufficient harmony with observations.

Nonaka’s interactive dialogue and practice can be interpreted, – as Maturana and Varela describe it – as an “**act of knowing by languaging** which works out our lives in a continuous becoming”, as social negotiation towards a truth that best fits reality. Nonaka expresses it in the following: “Knowledge is first and foremost an issue of how we, as individuals, respond to reality and how we position that reality within ourselves. In other words, it is the issue of how we exist as individuals.” (Nonaka et al. 2008, p.9) The **SECI process** could be re-interpreted as a process in which the individual’s subjective thoughts (explicit focal beliefs and tacit justifications) are (externally) justified through social interaction with others and the environment to become (a form of) ‘truth’.

Knowledge has an **emergent nature**, i.e. it newly arises on a macro-level out of complex, non-linear **structures of interaction** between micro-level components. It is dependent on, but cannot be reduced to or predicted from these micro-level interaction structures. Knowledge and interaction structures underlie a dynamic process of continuous change through mutual influence of macro and micro levels and their internal and external environments. Thus, emerging knowledge eludes from being controllable or manageable in a traditional sense, but need to be managed with an **attitude of enabling**. This involves the provision and orchestration of sets of constraints and conditions in order to build infrastructures for interaction creating a structural field for potential knowledge to emerge. These fields are referred to as knowledge space, **enabling space**, or ‘ba’.

In one sentence, knowledge is a dynamic, complex, emergent structure that is knower-related, process-oriented, generative, experience-based, action-related, mostly tacit, relational, context-dependent and socially co-constructed in human interactions to functionally fit reality. “Knowledge is both an outcome – ‘a framework’ – and a process for incorporating new experiences and information.” (Tsoukas & Vladimirou 2001, p.974)

The portrayed understanding of knowledge forms the basis for building a constructivist model of knowledge (5.1.) and a complexity-based model of collective knowledge (6.1.) in search of a theoretical model for collective self-transcending knowledge.

3.2 The Idea of Learning

When we think of learning and change we naturally seem to think of something good. We seem to think of whatever kind of progress or growth, of some sort of development that holds something positive for us and enriches our capabilities and/or opportunities. With learning we connect that we can do things better, understand things better or even do and understand things that we have not been able to do or to understand before.

However, we can easily image that there are cases of learning where the outcome is not good in a common sense: We can learn to manipulate, to steal, to betray, to make war, just to name a few. Apparently, when we call for learning we need to spell out the kinds of learning we have in mind as well as its underlying goals. (Argyris & Schön 1978, p.9) The following sections will give a theoretical basis of learning and develop the understanding of the notion of learning which will be used within the course of further research.

3.2.1 Learning as Error Correction

Argyris and Schön place human action and human learning in the larger context of knowing. They understand human learning as the construction, testing, and restructuring of a certain kind of knowledge. (Argyris & Schön 1978, p.10) Humans are all subject to a ‘learning imperative’ as they need to adapt to changing environments, draw lessons from past successes and failures, detect and correct the errors of the past, anticipate and respond to

impeding threats, conduct experiments, engage in continuing innovation, build and realize images of the future.(Argyris & Schön 1996, p.xvii)

Within the field of organizational learning, they established a theory of learning that considers learning essentially as the **process of detecting and correcting errors**. (Argyris 1977, p.116; Argyris & Schön 1978, p.2) This chapter will focus on the theory's conceptual propositions concerning the learning process itself, irrelevant if performed by an individual or an organization. The conceptual bridge between individual and organizational/collective learning will be addressed later, in chapter 6.

Within Argyris and Schön's theory, **error** is any feature of knowledge or knowing that inhibits learning. (Argyris 1977, p.116) It is the outcome of action mismatched to expectations and therefore surprising. (Argyris & Schön 1996, p.21) When detected, the error is corrected by **inquiry**, an intertwining of thought and action that proceeds from doubt to the resolution of doubt, with **doubt** being construed as the **experience of a problematic situation**, triggered by the mismatch between expected and actually achieved results of action. (Argyris & Schön 1996, p.11)

The intermediate outcomes, i.e. the learning products of organizational inquiry may take many forms, all of which, to qualify as learning must include evidence of a change in behavior that signifies changes in organizational theory-in-use. Often such changes are mediated by lessons such as interpretations of past experiences, inferences of causal connections, analysis of potentials, descriptions of conflicting views, critical reflections, or **images of desirable futures** and invention of the means by which they may be achieved. (Argyris & Schön 1996, pp.16–17)

Argyris and Schön distinguish three types of productive learning strategies: (Argyris & Schön 1996, p.20)

- (1) **Single-loop learning**, an instrumental, paradigm-constrained learning that leads to improvement in the performance of organizational tasks;
- (2) **Double-loop learning**, a paradigm-breaking inquiry through which an organization explores and restructures the values and criteria through which it defines what it means by improved performance;

- (3) **Deutero-learning**, an inquiry through which an organization enhances its capabilities for learning of types 1 or 2.

Single-loop Learning

When the error detected and corrected permits the organization to carry on its present policies and objectives, then that error-detection-and-correction process is single-loop learning. It can be compared with a thermostat that learns when it is too hot or too cold and turns the heat on or off. (Argyris & Schön 1978, pp.2–3)

There is a single feed-back loop mediated by organizational inquiry which connects detected error to organizational strategies of action and their underlying assumptions which are modified so as to keep organizational performance within the range set by existing organizational values and norms. The values and norms themselves remain unchanged. (Argyris & Schön 1996, p.21)

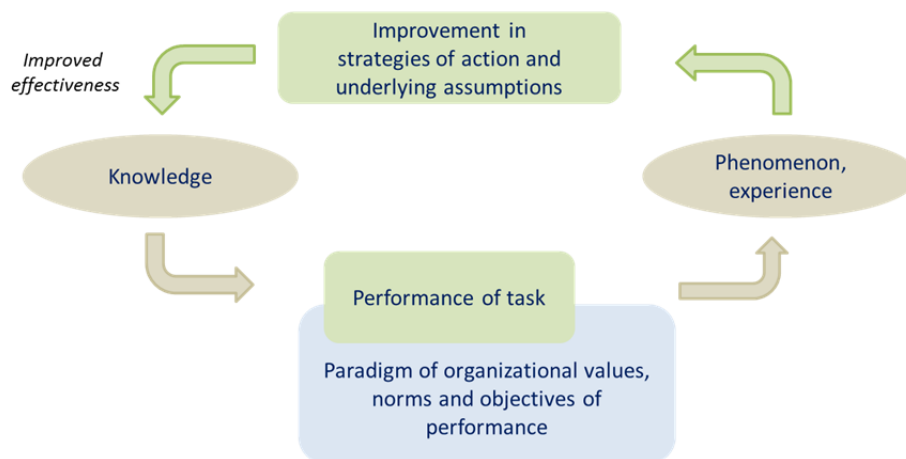


Fig. 3.5: Organizational Single-loop Learning

Single-loop learning is sufficient where error correction can proceed by changing organizational strategies and assumptions within a constant framework of norms for performance. It is concerned primarily with **effectiveness** – that is, with how best to achieve existing goals and objectives and how best to keep organizational performance within the range specified by existing norms. (Argyris & Schön 1978, p.21)

Double-loop Learning

When the error detected requires a correction that involves the modification of an organization's underlying norms, policies, and objectives, it requires a more comprehensive inquiry which is denoted as double-loop learning. It can be compared with a thermostat that could question itself about whether it should be set at 68 degrees. (Argyris & Schön 1978, p.3)

There are two feedback loops connecting the detection of error not only to strategies and assumptions for effective performance but to the very norms which define effective performance. Results of inquiry will take the form of a restructuring of organizational norms. Strategies and assumptions may change concurrently with, or as a consequence of, change in values. (Argyris & Schön 1996, p.21)

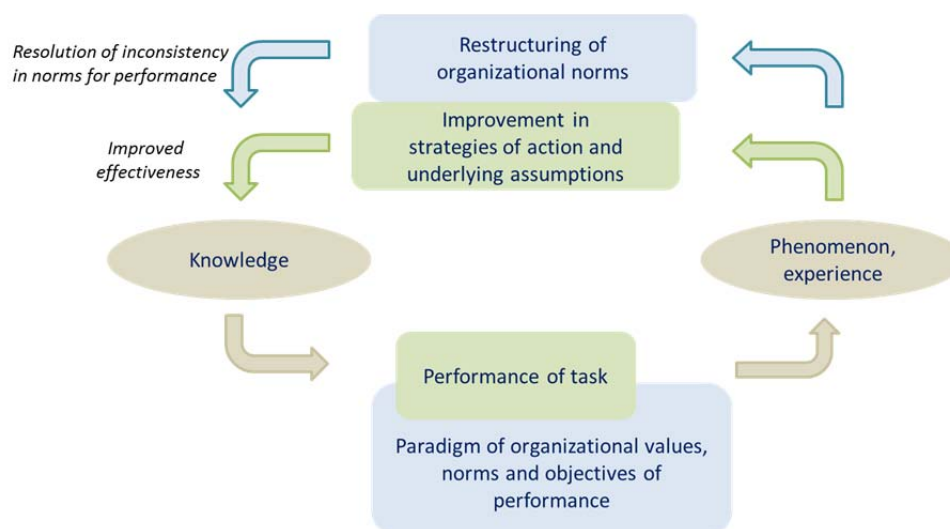


Fig. 3.6: Organizational Double-loop Learning

Double-loop learning is concerned with the **resolution of inconsistency in norms for performance**. In organizational double-loop learning, incompatible requirements in organizational theory-in-use are characteristically expressed through a conflict among members and groups within the organization. Double-loop learning consists of the process of inquiry by which these groups confront and resolve their conflict. In this sense, the organization is a medium for translating incompatible requirements into interpersonal and intergroup conflict. (Argyris & Schön 1978, pp.22–23)

In any particular instance of double-loop learning, the resulting changes in values and norms may not be judged to be desirable: their desirability can be determined only through a situation-specific critique of the changes themselves and of the inquiry through which they are achieved. Nevertheless, it is through double-loop learning alone that individuals or organizations can address the desirability of the values and norms that govern their theories-in-use. (Argyris & Schön 1996, p.22)

Deutero-learning

Requirements of organizational learning are not one-shot but continuing. Organizations need to learn how to carry out single- and double-loop learning. Argyris follows Bateson to call this sort of '**learning to learn**' deutero-learning. (Argyris & Schön 1978, p.26)

When an organization engages in deutero-learning, its members learn about organizational learning. They reflect on and inquire into previous contexts for learning. They discover what they did that facilitated or inhibited learning, they invent new strategies for learning. (Argyris & Schön 1978, p.27) **Learning single-loop learning focuses on learning for effectiveness while learning double-loop learning focuses on learning to resolve conflicting norms for performance.**(Argyris & Schön 1978, p.28)

Sometimes double-loop learning is equated with deutero-learning. Though, Argyris and Schön made an explicit distinction between double-loop learning and deutero-learning. They understood deutero-learning to mean second-order learning, reflecting on the first-order actions. Deutero-learning can occur by going meta on single or double-loop learning. The distinction is important because the knowledge and skills required to produce double-loop learning are significantly greater and more complicated than those required for deutero-learning on single-loop issues. (Argyris 2003, p.1179)

A critically important kind of organizational double-loop learning, therefore, is the second-order learning through which the members of an organization may discover and modify the learning system that conditions prevailing patterns of organizational inquiry. (Argyris & Schön 1996, p.29) This could be described as learning double-loop learning by double-loop learning.

3.2.2 Learning as Transforming Experience

The Kolb Learning Cycle in a form of 'plan-act-reflect' has become a well-known model for learning from experience. In general it is connected with a simple process of learning that results from past experience. However, this seems to be a popular but imprudent reduction and isolated consideration and does not justice to the underlying Experiential Learning Theory. It is worthwhile to look at Kolb's fundamental thoughts in more detail as they bring about more than a simple past-oriented model and can serve as a basis for an extended notion of learning that helps building a model for the learning process under research.

The Experiential Learning Theory was developed by David Kolb in 1984. Facing existing behavioral and cognitive learning theories it was not meant as a third approach next to them but suggests a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior. (Kolb 1984, p.21)

Behavioral learning theories are based on an empirical epistemology and deny any role for consciousness and subjective experience in the learning process. Rationalist, cognitive learning theories are based on an idealistic epistemology and emphasize cognition over affect, focusing on acquisition, manipulation, and recall of abstract symbols.(Kolb 1984, p.20)

What behavioral and rationalist approaches have in common is that they tend to define learning in terms of the outcomes of learning. Based on Locke's idea that there are elements of consciousness that always remain the same, so-called 'simple ideas', the extent of learning seems to be measurable by the amount of fixed ideas a person has accumulated. Various combinations and associations of these fixed elements form varying patterns of thought, appearing as stored factual knowledge or habits representing behavioral responses. (Kolb 1984, p.26)

Opposite to that, Experiential Learning Theory proceeds from a different set of assumptions. Ideas are not fixed and immutable elements of thought but are formed and re-formed through experience. No two thoughts are ever the same as experience always intervenes. Thus, experiential learning describes learning as a process whereby concepts are derived from and are continuously modified by experience. (Kolb 1984, p.26) One essential aspect within this approach, the aspect which makes this approach interesting for concerns to

broaden our view on learning, is the definition and understanding of 'experience' in this context, which we will see below.

Kolb developed the Experiential Learning Theory by taking together Dewey's philosophical pragmatism, Lewin's social psychology, and Piaget's cognitive-developmental genetic epistemology. This integrated perspective defines learning as "**the process whereby knowledge is created through the transformation of experience.**" Knowledge results from the combination of grasping and transforming experience. (Kolb 1984, p.41) The following propositions characterize this transformation of experience:

Learning as Continuous Process Instead of Outcome

To understand learning, we must understand the nature of knowledge, and vice versa. Knowledge results from the transaction between objective and subjective experiences in a process called learning. Knowledge is a transformation process, being continuously created and recreated, not an independent entity to be acquired or transmitted. (Kolb 1984, p.38) Each act of understanding is the result of a process of continuous construction and invention. **Learning is an emergent process** while its outcomes represent only historical record, not knowledge of the future. (Kolb 1984, p.26)

Learning as Transformation of Both Objective and Subjective Experience

Knowledge is continuously derived from and tested out in the experience of the learner. It is in the **interplay between expectation and experience** that learning occurs. Kolb refers to Hegel's phrase, "Any experience that does not violate expectation is not worthy of the name experience." (Kolb 1984, pp.27–28)

The reciprocally determined transactions between learner and environment that are involved are symbolized in the **dual meanings of the term experience** – one subjective and personal, referring to the person's internal state, as in "the experience of joy and happiness", and the other objective and environmental, as in "20 years of experience on this job." These two forms of experience interpenetrate and interrelate in very complex ways. (Kolb 1984, p.35)

To illustrate this complexity of the notion of experience Kolb gives a citation from Dewey's work:

“Every genuine experience has an active side which changes in some degree the objective conditions under which experiences are had. [...] The word ‘interaction’ assigns equal rights to both factors in experience – objective and internal conditions. Any normal experience is an interplay of these two sets of conditions. Taken together they form what we call a situation. [...] An experience is always what it is because of a transaction taking place between an individual and what, at the time, constitutes his environment, whether the latter consists of persons with whom he is talking about some topic or event, the subject talked about being also part of the situation; the book he is reading [...]. The environment, in other words, is whatever conditions interact with personal needs, desires, purposes, and capacities to create the experience which is had. Even when a person builds a castle in the air he is interacting with the objects which he constructs in fancy.”(Kolb 1984, p.35)

Kolb chooses the concept of ‘transaction’ to emphasize a more fluid, interpenetrating relationship between objective conditions and subjective experience, such that once they become related, both are essentially changed. Kolb refers to learning in T-groups which is seen to result from **learners’ active creation** of situations that meet their learning objectives. In this sense the members of the group **negotiate** as each one attempts to influence or control the stream of events and **to satisfy his personal needs**. Individuals learn to the extent that they expose their needs, values, and behavior patterns so that perceptions and reactions can be exchanged. **“Learning in this sense is an active, self-directed process that can be applied not only in a group setting but in everyday life.”**(Kolb 1984, p.36)

Learning Requires Resolution of Dialectic Conflicts

As stated above, knowledge results from the combination of grasping and transforming experience. Kolb assigns two dialectically related abilities to each (figure 3.7): **concrete experience (CE)** and **abstract conceptualization (AC)** as modes of grasping experience on the one hand and **reflective observation (RO)** and **active experimentation (AE)** as modes of transforming experience on the other hand. (Kolb & Boyatzis 2000, p.3) These four modes form the frame for a four-stage learning cycle: Immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into

abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences.(Kolb & Boyatzis 2000, p.3)

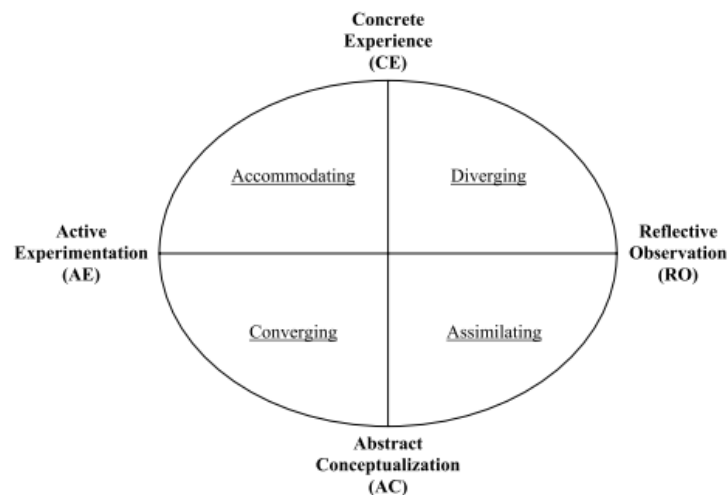


Fig. 3.7: Four Modes of Experiential Learning (Kolb & Boyatzis 2000, p.3)

Nevertheless, the learning cycle is not meant as a process model but illustrates **four modes of experiential learning**. (Kolb & Boyatzis 2000, p.3) New knowledge, skills, or attitudes are achieved through confrontation among these four modes of adaptation to the world. Learning results from resolution of conflicts between them. (Kolb 1984, p.29)

The **ideal of simultaneous application of all modes** at the same time – action AND reflection, being concrete AND conceptual - seems to be difficult to achieve, so the learner must continually choose among them. Thus, in the process of learning, one moves in varying degrees from actor to observer and from specific involvement to general analytic detachment. Learning is by its very nature a tension- and conflict-filled process. The way in which the conflicts among the dialectically opposed modes of adaption get resolved determines the level of learning that results. If conflicts are resolved by suppression of one mode and/or dominance by another, learning tends to be specialized around the dominant mode and limited in areas controlled by the dominated mode. (Kolb 1984, pp.30–31)

The patterned way how learners choose in specific learning situations according to their individual propensities between CE or AC and RO or AE result in **four characteristic, basic learning styles**: diverging (viewing concrete situations from many different points of view),

assimilating (understanding a wide range of information and putting into concise, logical form), converging (finding practical uses for ideas and theories), accommodating (learn from primarily 'hand-on' experience). (Kolb & Boyatzis 2000, p.3)

When we consider the higher forms of adaptation – the process of creativity and personal development – conflict among adaptive modes needs to be confronted and integrated into creative synthesis. The creative act is a product of detachment and commitment, of passion and decorum, and of a freedom to be dominated by the object of one's inquiry. At the highest stages of development, the adaptive commitment to learning and creativity produces a **strong need for integration of the four adaptive modes**. Integration of dialectic conflicts among the adaptive modes are the hallmark of **true creativity and growth**. (Kolb 1984, p.31)

Learning as Holistic, Lifelong Process of Adaptation to the World

To learn is not the special province of a single specialized realm of human functioning such as cognition or perception. It involves the **integrated functioning** of the total organism – thinking, feeling, perceiving, and behaving. Learning is *the* major process of human adaptation to the social and physical environment. When learning is conceived as a **holistic adaptive process**, it provides conceptual **bridges across life situations**, such as scientific inquiry, problem-solving, decision-making and creative processes, **and across time and space**: performance (an immediate action reaction to a limited situation or problem), learning and development (long-term adaptation to one's total life situation) form a continuum of adaptive postures to the environment, varying only in their degree of extension in time and space. Viewed from that perspective, learning is portrayed as a **lifelong process**. (Kolb 1984, pp.31–34)

Kolb's usage of the term 'adaptation' can be interpreted as going far beyond an adaption to a given environment. He based his theory in 1984 on the work of Piaget, a pioneer of constructivism who fundamentally influenced the development of Glasersfeld's radical constructivism in the late 80ies. 'Adaptation' rather need to be understood in the sense of a self-directed creation of situations through negotiation, or to use constructivist terminology, in the sense of active co-creation of the world. Kolb's thoughts on reciprocal determination - a mutual and essential change of objective conditions and subjective experience through

transactions - come close to Glaserfeld's concept of functional fitness which portrays adaptation in a functional sense (Glaserfeld 1984) or to Maturana and Varela's suggestion to "understand learning as an expression of structural coupling which always maintains compatibility between the operation of the organism and its environment" (Maturana & Varela 1987, p.172)

3.2.3 Learning as Realizing Human Potential and Individual Cultivation

A 'generative' perspective on learning can also be found within Senge's approach to organizational learning (Senge 1990). It manifests in Senge's basic understanding of a 'learning organization' – an organization that is continually expanding its capacity to create its future. 'Survival learning' or 'adaptive learning' is important and necessary, but for a learning organization, it must be joined by '**generative learning**' (Senge 1990, p.14), a "type of learning that could lead to the creation of a world not governed primarily by habit". (Senge et al. 2004, p.11)

For Senge, real learning gets to the essence of what it means to be human. Learning organizations are possible because people have an intuitive desire to learn as a human want. By learning, people extend their capacity to create so that they re-create themselves and become a part of the generative process of life, a 'force of nature'. (Senge 1990, p.4.14; Senge et al. 2004, p.12)

In his famous book "The fifth discipline" he approaches organizational learning by uniting organizational adaptation and the realization of human potential through systems thinking. Learning organizations form through the mastery of five basic disciplines, which are all 'personal' disciplines in terms that they have to do with how we think, what we truly want and how we interact and learn together: (Senge 1990, pp.7–13)

- **Working with mental models** is the discipline to bring our internal pictures of the world to the surface and hold them rigorously to scrutiny on individual level or within "learningful" conversations.
- **Team learning** as a discipline starts with this learningful dialogue to enter into a genuine 'thinking together' resulting in a performance that is more than the sum of its parts.

- **Personal mastery** is the discipline of continually clarifying and deepening our personal vision.
- The latter is key for the discipline of **practicing shared vision**. When there is a genuine vision, people excel and learn, not because they are told to, but because they want to.
- Finally, **systems thinking** is the fifth discipline that integrates all disciplines. It is a shift of mind, – from seeing ourselves as separate from the world to connected to the world, from seeing problems as caused by someone or something ‘out there’ to seeing how our own actions create the problems we experience.

‘Working with mental models’ can be compared to what Argyris and Schön called double-loop learning. People investigate their own values and norms residing in their patterns of cognition as a paradigm. In describing ‘team learning’, Senge goes one step further. Here, he refers to a specific kind of dialogue which was proposed by David Bohm to reveal the three types of incoherence in human thinking: denial of its participative character, running like a program without tracking reality, and establishment of its own reference for solving problems. It aims at realizing the ‘representative and participatory nature of thought’ so that learners become **observers of their own thinking**. (Senge 1990, pp.224–225)

Senge uses the word ‘**metanoia**’ for this shift of mind as for the Greeks, it meant a fundamental shift or change, or more literally **transcendence** (‘meta’ – above or beyond) **of mind** (‘nous’ – root of mind). “To grasp the meaning of ‘metanoia’ is to grasp the deeper meaning of ‘learning’, for learning also involves a fundamental shift or movement of mind.” (Senge 1990, p.13) This kind of inquiry underlying Bohm’s ideas on dialogue has been categorized as a third kind of learning level, ‘**triple-loop learning**’. It includes inquiry and insights into the nature of the processes by which people form their paradigms and encompasses a new mode of attention and perception. (Isaacs 1993, p.30,38) This new mode of attention is a so-called ‘**proprioceptive attention**’ as it implies a kind of ‘online’, not memory-based awareness which allows for observing the process of thinking itself. (Isaacs 2001, p.735)

Isaacs’ perspective is in line with the recent advancement of the notion of ‘triple-loop learning’. First publicly mentioned in 1992, the term has arisen together with the discussion on learning organizations. It is used for various conceptual frames concerning a third type,

order, or level of learning which amends Argyris and Schön's single and double loops. Reviewing the 90ies literature, Tosey et al. (2011) identified three principal distinct conceptual sources: (a) an equivalent to Argyris and Schön's deutero-learning, (b) a level beyond and superior to Argyris and Schön's single- and double-loop learning, (c) a third level influenced by Bateson's 'learning III' from his 'levels of learning' framework. (Tosey et al. 2011, p.293).

By exploring Argyris and Schön's as well as Bateson's original work, Tosey et al. provide clarification and advance the concept 'triple-loop learning'. First, it should not be regarded as an equivalent to deutero-learning. As also stated in chapter 3.2.1, Argyris and Schön regarded deutero-learning as going meta on single- or double-loop learning, with 'meta' indicating a reflexivity on single- or double-loop learning itself, but not as a higher order of learning process beyond double-loop learning. Furthermore, they never explicitly used the term triple-loop learning. Second, attempts to just extend Argyris and Schön's logic to a third, superior level remained imprecise. They mainly refer to a change in 'paradigms' that govern the governing variables that are addressed by double-loop learning, but they do not provide clear definitions of what these paradigms might include. Third, as a result, Tosey et al. favor the third - Bateson-influenced – conceptualization as the most promising to advance the notion of triple-loop learning. It holds that triple-loop learning refers to an **unpredictable and uncontrollable higher order of learning beyond reflexivity, cognitive skills and language**. It is not inherently superior to other levels, as it follows a recursive structure that also implies other levels, and it is not necessarily more desirable as it entails the risk of non-predictability and psychological and/or organizational breakdown and destruction. (Tosey et al. 2011, pp.294–298)

- **Recursive organization of levels.** Within Bateson's levels of learning, the next higher level inquires into frameworks used on the lower level, thus changes the process of learning on lower levels. As a consequence, levels cannot be seen as separated, but each successive level extends beyond the boundary of the previous level and at the same time includes it. Learning III represents a multilevel approach to change where levels are recursively organized in concentric circles. Levels are orders of recursion, they go in parallel and indicate different orders of abstraction, not ranks of superiority. (Tosey et al. 2011, p.299)

- **Non-predictability.** Bateson was sceptic that Learning III can be instrumentalized and planned. Learning III follows the recursive logic of complexity where causality flows from cause to effect and back again, so that ‘a given phenomenon, viewed in context, is both the cause and effect of related phenomena and, ultimately, its own cause’. (Tosey et al. 2011, p.299)
- **New type of reflective grammar.** Bateson’s Learning III extends beyond language where aesthetic experience plays an important role. The higher order cannot be constituted by just talking about Learning II but requires ‘a different type of intelligence’, a new category beyond intellectual, cognitive reflection which is enabled by openness to transconceptual experience and might result in a profound reorganization of character and transcendence of the very concept of self. (Tosey et al. 2011, pp.298–300)

According to Starr and Torbert (2005), triple-loop inquiry represents a **change in consciousness** which affords the capacity to be fully present. This ‘triple-loop-awareness’ “occurs in any moment when there’s an attention distinct from the mental thinking, from physical sensing, and from the objects of perception”. It “is the simultaneous awareness of all 4 territories of experience – of the outside world, one’s own behavior, one’s own feelings and thoughts, and at the same time, a kind of witnessing of all this.” (Starr & Torbert 2005, p.87)

Being concerned with questions of how to create profound change and radical innovation, Peschl (2007b) describes triple-loop learning as a learning strategy which extends the process of learning and change to the existential realm and the domain of wisdom. While double-loop learning focuses on the intellectual and cognitive domain, triple-loop learning focuses on a domain where the cognitive domain itself is embedded in: the fundamental, existential domain of the whole person which could be described as the ‘self’. (Peschl 2007b, p.138)

This existential domain goes beyond the level of personal skills, competencies, personality, etc. because it **transcends the domain of personality traits, behavioral and cognitive patterns** touching a fundamental level of being and wisdom, far beyond the cognitive and classical knowledge domain. (Peschl 2007b, p.138)

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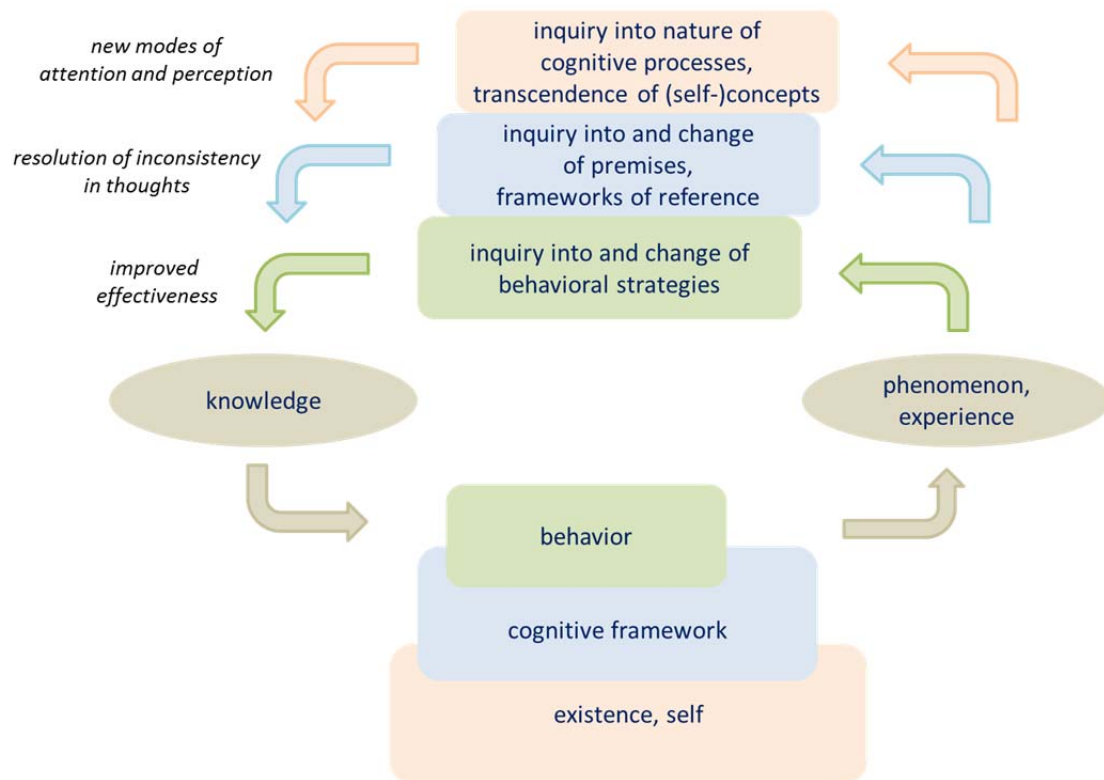


Fig. 3.8: Individual Triple-loop Learning

While single-loop-learning responds to change with processes of redesigning and adaptation (**behavioral reflection**) and double-loop-learning responds with processes of reframing and considerations of the observer's relationship to the observed systems (**cognitive reflection**), triple-loop-learning enters the domain of a more fundamental level of change that goes beyond reframing and considers more than only intellectual or cognitive matters. Its approach to coping with change is to focus on questions of **finality, deep intention, purpose, heart and will**. In this mode, change is not solely based on cognitive reflection any more, but more importantly on **existential reflection** and learning. The goal is to bring the existential level of a person, his/her will, his/her acting, as well as his/her cognitive domain into a **status of inner unity** with itself and with its future potentials as well as with future requirements. (Peschl 2007b, p.139; Peschl & Fundneider 2008b)

In the mode of action these domains and loops are closely intertwined and depend on each other. Peschl refers to this perspective of learning which takes into account all levels of change (and especially the existential level) as '**individual cultivation**' (Peschl 2007b, p.139) From the perspective of triple-loop learning, learning is not only about knowledge transfer, knowledge construction, knowledge processes, reflection, etc., but also includes the

development and change at the more profound level of the person(-ality). (Peschl 2007b, p.142)

Garrido (2009) goes one step further and uses 'evolution' as a synonymous for learning. In the context of business sustainability, he distinguishes between change through adaptation (change that fosters individual's or organization's coherence with the environment in a stressing, non-permanent way) and change through evolution (change that fosters coherence in a permanent way). Adaption is reversible and stressing in general. Evolution is irreversible and prevents the need for further adaptation, actually relieving from the associated stress. Learning is then interpreted as an evolutionary process through which one augments self-coherence *and* coherence with environment. (Garrido 2009, p.214)

3.2.4 Learning from the Future

Learning from the Past

Argyris and Schön's learning theory is based on past actions and outcomes that we reflect on, or on whose underlying frame of reference we reflect. In any case the process of learning is grounded in past experiences, in something that has already happened. Similarly, Kolb's experiential learning cycle has always been interpreted as learning from the past only, taking for granted that when he talks about experience he meant experiences from the past. Following that, learning from the past has been the focus within most change and learning methods and respective methodologies are well known and well developed.

Though this type of learning is important for certain tasks and challenges, it is not enough for moving into a future that differs profoundly from the past. Scharmer names various reasons why today's challenges cannot be adequately addressed by operating only on the basis of past experience: Sometimes the experiences of the past are not very helpful in dealing with the current issues. Sometimes the experiences of the past are even the biggest impediment for coming up with a creative response to the challenge at hand. (Scharmer 2007b, p.8).

Scharmer and Käufer (Scharmer & Kaeufer 2010) argue that today's organizational decision-making is not only confronted with **dynamic and social complexity**, but more and more with a new type of complexity which they call **emerging complexity**. Dynamic complexity means

that there is a systematic distance or delay between cause and effect in space or time which can be addressed with a 'whole systems' approach. Social complexity means that there are diverse interests and worldviews among stakeholders. This can be addressed by a multi-stakeholder approach. Emerging complexity describes situations of disruptive and deep change in which the solution to a problem is unknown, the problem statement itself is still unfolding, and the key stakeholders are not yet identified. The future cannot be predicted by the trends and trajectories of the past anymore. The greater the emerging complexity of a situation, the less reliable are decisions based on past experience and we must deal with situations as they evolve. For these situations we need a new approach. (Scharmer & Käufer 2010:21).

Learning from the Future

Within Nonaka's knowledge-based management, it is recognized that for organizations it is not sufficient to learn from the past: "Companies have to create new futures in order to survive. Those futures can no longer be extensions of the past; they must be leaps of faith into tomorrow. CEO's cannot be content to analyze situations using empirical data and deductive reasoning; they must also make **inductive jumps** according to their ideals and dreams." (Nonaka & Takeuchi 2011, p.67)

Scharmer realized that the most impressive leaders and practitioners seem to operate from a process that "pulls them into future possibilities". They "sense and connect with a future possibility that is seeking to emerge". (Scharmer 2007b, p.8) Senge describes it as "creating the world anew", based on a radically different view of our collective capacity to "listen to the course of being in the world and bring it to reality as it desires"(Scharmer 2007b, p.xiii Foreword)

Here, a second - not well recognized - type and source of learning comes into play which Scharmer calls 'learning from the future as it emerges'. It **involves intuition** and embraces high levels of ambiguity, uncertainty, and willingness to fail. "It involves opening ourselves to the unthinkable and sometimes attempting to do the impossible. But the fears and risks are balanced by feeling ourselves part of something important that is emerging that will truly make a difference." (Scharmer 2007b, p.xvi)

Learning from the future signifies a **heightened state of attention** that allows individuals and groups to operate from a future space of possibility, in which they drop the non-essential aspects of the self and open themselves to new aspects of their highest future possible future self. (Scharmer 2007a, p.1,7). It is an approach that builds on sensing, presencing and prototyping emerging opportunities: (Scharmer 2007b, pp.61–62)

- **Sensing** is described as the view from ‘within’ – a perception that begins to take shape when we begin to feel and sense the whole field. It is usually accompanied by increased energy and a shift to a ‘deeper place’.
- **Presencing** is the state we experience when we have opened our minds, our hearts and our intentions or wills and can, as a result, view things from the source. It allows us to connect and move with emerging new realities and rapid change that cannot be addressed by reflecting on past experiences.
- **Prototyping** means to explore the future by doing, and builds on a practical integration of the head, heart and hand.

‘Presencing’ is a blend of the words ‘presence’ and ‘sensing’ and describes both, the overall process of learning from the future as well as a specific quality of state within this process.

As the overall process, presencing

- means to sense, tune in, and act from one’s highest future potential – the future that depends on us to bring it into being. (Scharmer 2007b, p.8)
- denotes the ability of individuals and collective entities to link directly with their highest future potential and to operate from a more generative and more authentic presence in the moment – in the now.(Scharmer 2007b, p.52)
- involves a particular way of being aware of and experiencing the present moment. (Scharmer 2007b, p.52)
- is the process of the (current) self and the (emerging) Self listening to each other. (Scharmer 2007b, p.41)
- is based on practices of suspending, redirecting, letting go, letting come, envisioning, enacting, embodying (Scharmer 2007b, p.467)

As a specific quality, presencing refers to the particular way of being in the now, the deeper ‘structure of attention’ that learning from the future requires in order to become a deeper

process of learning and change. Scharmer calls it 'seeing our seeing' with a deeper awareness on three levels: the open mind, the open heart and the open will. When all three levels of opening occur, there is a profound shift in the nature of learning as things can be viewed from the source. (Scharmer 2007b, pp.xiv–xvi)

- An **open mind** is the beginning of all real learning and arises when people truly start to recognize their own taken-for-granted assumptions and start to hear and see things that were not evident before.
- An **open heart** means that people step outside their traditional experience and truly *feel* beyond the mind.
- An **open will** means that people 'see' that the future could be different. This does not arise when they are simply intellectually convinced but when the deepest level of commitment is unlocked.

Thus, learning from the future means to uncover the place within or around us where our attention and intention originates. It is the place and source from which we operate when we do something. It is a **blind spot** as we can't see it, we aren't aware of it as it is an invisible dimension of our social field, of our everyday experience in social interactions. (Scharmer 2007b, pp.6–7)

3.2.5 Summary

State-of-the-art understanding of learning has evolved over the last 35 years. Argyris and Schön laid the basis during the 70ies by explaining learning as a process of detection and correction of errors. The goal of this learning process was to either to improve performance for effectiveness within a given paradigm or to break paradigms by resolution of inconsistency in norms that define performance. The trigger for learning processes was meant to be the experience of a problematic situation created by a mismatch of expected and actual results of past action. Argyris speaks of a '**learning imperative**' imposed by the fact of change. We need to adapt to this change, eliminate its threats, and build images of the future by learning from past errors and lessons as well as from experiments.

Kolb broadened this understanding by explaining learning as an emergent process of permanently grasping and transforming experience in both subjective and objective forms.

Experience is understood as any transaction between an individual (his/her personal needs, desires and purposes) and his/her environment and conditions. Interaction with the individual's 'internal environment' like internal states, images, visions, etc., creates subjective experience, interaction with the external environment creates objective experience. By extending the notion of experience beyond (objective) experiences from the past Kolb opens up possibilities for learning from subjective internal experiences which may refer to the present or even to the future.

Kolb assigns two modes each to grasping experience and to transforming experience resulting in four modes of learning. The level of learning is dependent on resolution of dialectic conflicts between these modes. The ideal level of learning occurs when they are simultaneously applied: action AND reflection, being concrete AND conceptual. As this is difficult to achieve, the learner usually moves in varying degrees from actor to observer, from specific involvement to general analytic detachment.

For Kolb, learning is as well a process of human adaptation to the (changing) environment. However, he turned the pushing imperative into a pulling personal chance by considering learning as an active, self-directed process to **satisfy personal needs and co-create the world**. Aspects of creativity and personal development are integrated as higher forms of adaptation. These require the highest form of learning: the integrated synthesis of all 4 modes of learning.

Garrido's evolutionary learning or Senge's generative learning describe a personal process of re-creating ourselves, our reality and our future. For Senge learning is a deep and essential **human want**. We do not only have the chance, but we have an intuitive desire to learn as through this continuous process of learning and change we realize our human potential and learn to become 'a **force of nature**'.

Triple-loop learning reflects this in a view on learning as recursive, multi-level process of response to change which includes development and change at the behavioral, cognitive AND existential level of the personality. Learning processes that explicitly integrate the latter characterize learning processes as **individual cultivation** enabling realization of future potential in an ethic and responsible way.

Organizing Future

Within this research, learning is understood as this integrated multi-level process. The research question addresses domains of knowing and learning that are located especially on the existential level and touch the realm of human potential, self-actualization and creation of the future. It is concerned with a perspective which is relatively new to the scientific discussion: learning from the future and creating self-transcending knowledge.

4 Self-transcending Knowledge

As discussed within chapter 2.1.2, a group of today's leading business thinkers identified the capacity to sense and actualize emergent realities as one of the key new capabilities required in a knowledge society to cope with future challenges. All of them recognized that this refers to **capabilities beyond rationality**, dealing with intuition (Mintzberg), bounded rationality, creativity (Teece), and imagination (Hamel).

Within knowledge management, it has been Otto Scharmer (2001) who – next to explicit and tacit knowledge - coined a notion for the specific kind of knowledge that brings forth the new: self-transcending knowledge. It is the epistemologically most elaborated concept of future-building knowledge. Yet, its underlying epistemological roots can also be identified within Nonaka's concept of phronesis (Nonaka & Toyama 2007). The following sections will illustrate Scharmer's concept, its epistemological roots and how these roots are also woven into Nonaka's concept. Common ground of the two concepts will be derived in order to formulate characteristic elements that constitute concepts of self-transcending knowledge. These already hint at the specific significance of the collective dimension, but before exploring this dimension in more detail within chapter 6, chapter 5 will present a model for learning processes around self-transcending knowledge, a theory for learning from the emerging future.

4.1 Scharmer's Concept of Self-transcending Knowledge

Capabilities to sense and seize emergent opportunities - to actualize emerging potential - touch the realm of creativity, of how we bring forth new realities. Thus it is key to develop a deep understanding of creative processes. (Senge, in: Scharmer 2007b, p.xi)

Scharmer illustrates the importance of bringing the upstream realm of innovation to the agenda of (knowledge) management by citing Hamel and Prahalad: "But focusing on the last stage of market-based competition, without a deep understanding of premarket condition, is like trying to make sense of the process of childbirth without any insight into **conception and gestation**. [...] Our experience suggests that most managers spend a disproportionate amount of time in the delivery room, waiting for the miracle of birth. But as we all know, the

miracle of birth is most unlikely, unless there's been some activity nine months previously.” (Scharmer 2001, p.141; citing Hamel & Prahalad 1994, p.46)

In order to sense, tune into and actualize emerging business opportunities, leaders have to access a new type of knowledge, a 'not-yet-embodied knowledge'. (Scharmer 2001, p.138) As this type of knowledge requires different learning infrastructures than explicit or tacit-embodied knowledge, Scharmer proposes an epistemological distinction between two types of tacit knowledge: tacit-embodied knowledge on the one hand and **not-yet-embodied knowledge** on the other hand, which he denotes as 'self-transcending knowledge'. Self-transcending knowledge is described as “tacit knowledge prior to its embodiment in day-to-day practices” and refers “to a territory of knowledge formation that is upstream from both explicit and tacit-embodied knowledge.” (Scharmer 2001, p.139)

The challenge is to develop the capacity for '**precognition**', to “see the emerging opportunities before they become manifest in the marketplace”. (Scharmer 2001, p.137) Leaders need to learn to “intuit form” (Scharmer 2001, p.138) and enter the “space in which being emerges out of nothing”. (Scharmer 2001, p.142) In total, Scharmer identifies four levels of activities being part of the realm of learning from the future, resulting in various types of self-transcending knowledge: **reflection, imagination, inspiration and intuition**. (Scharmer 2001, p.140)

As this ability to “see the coming-into-being of the new” is usually associated with artists (Scharmer 2001, p.137), Scharmer uses the arts to give an analogy for all three types of knowledge: “The completed picture is the explicit reflection of the artist's work. The artist in the process of painting offers insight into the tacit knowledge she brings to the work. The artist in front of her blank canvas senses the emergent painting, much as Michelangelo, talking about his famous sculpture of David, sensed the emergent figure: ‘David was already in the stone. I just took away everything that wasn't David.’ The **ability to see a David where others just see rock** is what distinguishes the truly great artist. The same applies to leaders.”(Scharmer 2001, p.138) “When managers move into the upstream realm of innovation, they have to first **see it**.” (Scharmer 2007b, p.69)

To illustrate the differentiation of the three forms of knowledge - explicit, tacit-embodied and self-transcending knowledge - Scharmer presents the model of an iceberg as shown in figure 4.1 and uses the example of a loaf of bread to further explain the distinction: Weight,

price and ingredients of the bread are examples of explicit knowledge and the activities of baking and producing the bread are examples of tacit knowledge. However, the knowledge that enables a particular baker to invent baking bread in the first place is an example of not-yet-embodied knowledge. (Scharmer 2001, p.139)

In contrast to explicit knowledge above the waterline, both forms of tacit knowledge below the waterline are difficult to distribute and transfer across an organization. The focus is shifted from results (in form of explicit knowledge) to processes that produce these results (in form of tacit-embodied knowledge) and finally towards the “preceding thought conditions that allowed those processes to emerge” (in form of self-transcending knowledge). **Learning processes corresponding to self-transcending knowledge improve qualities of experience, awareness and thought.** (Scharmer 2001, p.138)

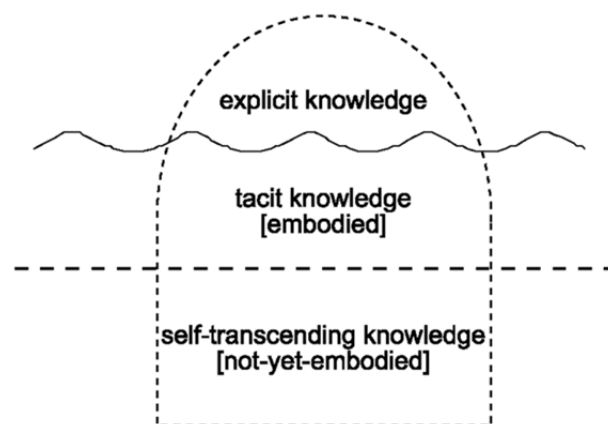


Fig. 4.1: Three Forms of Knowledge (Scharmer 2001, p.138)

Storage of information and explicit knowledge, then the interplay between explicit and tacit knowledge, have been the focus of first two phases of knowledge management. The question for the thought conditions that allow creative processes and tacit knowledge to evolve in the first place characterizes a third phase of knowledge management which is currently unfolding. It concerns the question for upstream drivers of the knowledge spiral – which was not yet answered within Nonaka’s leading knowledge management theory. (Scharmer 2001, p.139)

As such self-transcending knowledge has the highest leverage but is the most difficult to attain. (Scharmer 2000a, p.45) Self-transcending knowledge requires a different type of knowledge environment and learning infrastructure than explicit or tacit knowledge as it holds different epistemological assumptions and relates to reality from a different point of view (Scharmer 2001, pp.137, 140–141; 2007b, p.255):

- **Explicit knowledge** is conveyed as a piece of information that is separate from the practice or reality it denotes. It relates to the reality outside and captures knowledge about things that can be observed.
- **Tacit knowledge** is considered to be embodied in situated practice. It relates to the reality within and captures knowledge about feeling and doing things. It is based on lived experience which we can observe, reflect on and reproduce.
- **Self-transcending knowledge** is situated in an incipient reality that is brought into existence through a certain state of mind. It includes “**knowledge about thought as the origin of doing things**” and captures **knowledge about the sources or ‘place’ where thought and action originate and from which they come into being.**

	Explicit Knowledge	Tacit-embodied Knowledge	Self-transcending Knowledge
Type of Knowledge	knowledge about things	knowledge about enacting things	knowledge about origins for enacting things
Point of Reference	exterior reality	enacted reality	not-yet-enacted reality
Experience	observation	action	aesthetic
Action/Reflection Ratio	reflection without action	reflection on action	reflection in action

Tab. 4.1: Three Epistemologies (Scharmer 2007b, p.256)

The shift from organizing around tacit-embodied knowledge to organizing around not-yet-embodied knowledge touches an epistemological transition towards a fundamentally different perception of reality as proposed by Heidegger or Nishida. Heidegger conceived of reality from a space in which being emerges out of nothing. Nishida denominated this field

of nothing as **'pure experience'** (Scharmer 2001, p.143). These philosophical roots will be further investigated in section 4.2.

The **lever** to these kinds of learning processes cannot be found in things that are around the learner, but **within his own self**. (Scharmer 2001, pp.138–139) While explicit knowledge is about describing the reality, and tacit-embodied knowledge is about “enacting the reality it refers to”, self-transcending knowledge is “situated in an incipient, not-yet-enacted reality” that is brought into existence through a **state of mind that transcends the distinctions between 'inside' and 'outside', between knowing and acting**.

The focus of attention is on the primary, emergent common ground from which all these distinctions and human action arise in the first place, before any action arises, on that which transcends the current self toward the most ultimate common ground (**source**) that is prior to subject-object distinctions”. (Scharmer 2001, pp.141, 143; Scharmer 2007b, p.277) It refers to the **“formative state of knowledge that precedes the separation of subject and object”** (Scharmer 2001, p.139).

In order to capture this most upstream level of social action, the knower must engage in **an act of 'action-intuition', 'presencing', 'reflection in action', or primary knowing**. (Scharmer 2001, p.141; Scharmer 2007b, p.255) Here, the knower can **experience a type of cognition which is beyond usual downloading** of mental frames and can enter a deeper level of knowing. (Scharmer 2007b, p.33)

While embodied tacit knowledge is based on action experiences, not-yet embodied knowledge is based on **aesthetic experiences**. Scharmer refers to those experiences as aesthetic experiences which have the property of synchronicity between action and reflection – that is, **zero feedback delay**. In an aesthetic experience, the subject is within (watching something) and outside of herself (watching herself) *at the same time*. **The self conceives of its action while acting**. These are deep states of attention and awareness which are well known by top athletes in sports. (Scharmer 2000a, p.37,57; 2001, p.142)

4.2 Epistemological Roots

Pure Experience

Scharmer relates his concept of self-transcending knowledge to the epistemological concept of 'pure experience' as they share the focus on "that which transcends the current self toward the most ultimate common ground that is prior to subject-object distinctions" (Scharmer 2001, p.143)

The concept of pure experience can be found throughout American, European and Asian philosophy. The notion of 'pure experience' was first introduced by the founder of American psychology - philosopher, psychologist and Harvard Professor **William James** in his essay "A World of Pure Experience" (1904) when he looked to probe what he perceived to be "the underlying experiential unity behind language and reflective or conceptual thought". (Krueger 2007, pp.1–2) For James, pure experience describes "a primordial level of unified experience that arises prior to the subject-object distinction" and grounds any phenomenology of human experience. It is "the **non-conceptual** givenness of the aboriginal field of the immediate, a phenomenal field **prior to the interpretative structures** that we subsequently impose upon it. [...] pure experience is pure seeing. It sees the world but does not thematize it. [...] knowing can [...] be explained as a particular sort of relation towards one another into which portions of pure experience may enter." (Krueger 2007, pp.2–3) This pure unadulterated experience forms the cornerstone of James' 'radical empiricism'. Criticizing the 'orthodox' empiricism for relying on pre-established linguistic categories as the starting point for recording observations and not on direct lived experience, James bases his radical empiricism upon the insistence that proper knowing, spontaneous action, and hence inspired performances, issue from being open and in touch with the ground of 'pure experience'. We "must **begin from the flux of experience and encounter reality before conscious thought intervenes**, and before the separation of subject from object." (Chia 2003, p.965) "Separation of knower and known occurs only when a given 'bit' is **abstracted** from the flow of experience and retrospectively considered in the context of other categories."(Chia 2003, p.968)

Kitaro Nishida, Japan's foremost modern philosopher and founder of the Kyoto School of philosophy, adopted James' idea of pure experience in his earliest major work, *An Inquiry*

into the Good (1911). He conjoined it with the Zen concern of cultivating “an intuitive, pre-reflective insight into the nature of reality and experience” (Krueger 2007, p.1) which introduced a practical dimension to the notion and extends it to a transformative praxis. (Krueger 2007, p.11) Nishida’s formulation of pure experience shows three characteristics: (Chia 2003, p.970)

- It is realized prior to self-awareness and the subject/object distinctions.
- It is active, constructive and grasped from within, thus systematically self-developing and self-unfolding – the self in ceaseless construction and reconstruction.
- **Knowledge, feeling and volition form a unity**, thus ultimate reality is perceived cognitively, emotionally and volitionally.

The concept of pure experience and its fundamentally different way of approaching reality can also be found within postmodern continental philosophy. Botz-Bornstein (2003) demonstrates the link between Nishida’s ‘pure experience’ and **Ludwig Wittgenstein’s** “ungraspable, unsayable *Erlebnis*”. Referring to Wittgenstein’s “Philosophical Investigations” (1953) he highlights resemblances between Wittgenstein’s ‘Lebensform’ and Nishida’s ‘basho’ (Betz-Bornstein 2003, p.54) and shows that Wittgenstein tried to grasp “a process underlying or accompanying human experience that remains essential for these experiences, though at the same time being constantly different from them. This process [...] cannot be reduced to concepts abstracted *from* these experiences.” (Betz-Bornstein 2003, pp.56–57)

Chia (2003; 2006) establishes a link between pure experience and **Martin Heidegger’s** approach to human behavior which is grounded on a “phenomenology of ‘mindless’ everyday coping that forms the basis of all intelligibility.” Chia refers to Heidegger’s “mode of awareness that is characterized by an absorbed intentionality in which the being is totally immersed in his surroundings; a ‘being-in-the-world’ that is prior to mental representation and deliberate intentional action” which Heidegger calls ‘**dwelling**’: the world around us is experienced as so much a part of us that it is not viewed as an object for us to apprehend. (Chia 2003, pp.955–956; 2006, pp.640–641)

Both, James and Nishida, similar to Heidegger and Wittgenstein, reject a materialist view of reality that partitions the contents of our mental experience from the concrete world of experience in which we embody and act out this content. “Pure experience is [...] their

attempt to secure a space for both the first-person ontology of consciousness as lived *as well as* the third-person ontology of the physical world in the greater structure of the real. [...] **Consciousness**, for James and Nishida, is not a pre-given ‘thing’ but rather an **emergent process**, shaped and fed by the body’s agency: its action in and interaction with its world of experience” (Krueger 2007, pp.10–11)

Fields of Reflexive Awareness

Scharmer particularly refers to Nishida’s extended work on three ‘bashos’, three progressively more encompassing **fields of reflexive awareness** that through focused reflection return us to this aboriginal ground of pure experience. Attention is moved from the self and self-consciousness to acts of consciousness in which the self is no longer the focus (Scharmer 2001, p.143; Chia 2003, p.970):

- **Everyday Basho of Being**, where judgements are made **unreflectively**. Statements only refer to the object of observation without reference to the observer himself.
- **Basho of Relative Nothingness**, where judgements are made about the significance and **role of the self** and the act of exclusion of self-involvement is progressively raised into our awareness.
- **Ultimate Basho of Absolute Nothingness or pure experience**, the originary ground on which all judgements and subject/object distinctions are grounded. It is always at the background of consciousness. It is the ground of the self as ‘**no-self**’ that sees but itself cannot be seen and what Scharmer describes as our blind spot. Here the ‘I’ does not appear as an agent but as an action, an **acting intuition** prior to analysis.

Chia explains the (ultimate) basho as a “potentially fecund and pro-generative field of primordial knowing that inspires intervention, consciousness and understanding” and “from which consciousness and thought, identity and difference, individuality and meaning, self and other emerges” (Chia 2003, p.971) “In matters of **deep comprehension** one must be able to **grasp the absolute** by arriving at an unmediated penetration into the heart of things: a primitive state of pure unself-conscious experiencing in which the boundaries between knower and known, subject and object have been completely dissolved.” (Chia 2003, p.963)

To become a master in arts, including the art of management or the art of seizing potentials, one has to transcend technique and arrive at that Basho of Absolute Nothingness where art becomes seemingly effortless and the immersion of the self in a seamless flow of actions is all there is - 'it' instead of the 'I' acts. "The 'it' signifies that moment of trans-individuality when performance is no longer conscious or purposeful but directed by a spontaneous outpouring of unthought action." (Chia 2003, pp.973–974)

During the 80ies and 90ies of last century, immersion of the self in a seamless flow of actions has become well-known by the research of Mihaly Csikszentmihalyi and his concept of '**flow**'. "Being 'in flow' is [...] the subjective experience of engaging just-manageable challenges by tackling a series of goals, continuously processing feedback about progress, and adjusting action based on this feedback. Under these conditions, experience seamlessly unfolds from moment to moment, and one enters a subjective state with the following characters:" (Nakamura & Csikszentmihalyi 2002, p.90)

- Intense and focused concentration on what one is doing in the present moment
- Merging of action and awareness
- Loss of reflective self-consciousness
- A sense that one can control one's action
- Distortion of temporal experience
- Experience of the activity as intrinsically rewarding

Flow describes "experiences during which individuals are fully involved in the present moment" through "complete absorption in what one does" and "thoughts, feelings, and action are in concert". (Nakamura & Csikszentmihalyi 2002, p.89,92).

However, this is not exactly what Scharmer refers to. He rather borrows from cognitive scientist Rosch who coined the notion 'primary knowing' for situations when the "**perception shifts to happen from the field**" (Rosch & Scharmer 1999, p.9). By using the notion "field", she tries to come as close as possible to a sense of **integration of intention, body and mind** where one starts to be aware of perception happening from the whole field, not from within a separated perceiver. "Primary knowing has no location. So there isn't really a where or from where." (Rosch & Scharmer 1999, p.9)

According to Rosch, primary knowing differs from flow experiences. She depicts flow as a combination of little glints of the 'field' which becomes an absorptive imitation as the individual gets absorbed in the activity that went with it, an artwork, a prayer, a great idea etc. In flow, people are busy with their positive mental states but they got away from what the source of it was. Rosch understands flow as an "ignorant absorption state where time passes" (Rosch & Scharmer 1999, p.12) while primary knowing is a "**participatory mode of knowing**" (Rosch & Scharmer 1999, p.20). In flow, the self is lost or ignored - in primary knowing or pure experience the self is transcended. Thus, self-transcending knowledge can be understood as primary knowing based on a third level pure experience.

4.3 Nonaka's Concept of Phronesis

Nonaka's approach for future-building, self-transcending knowledge is to orchestrate knowledge processes by a knowledge vision and phronetic leadership (see chapter 2.1.3 and 2.2). He also refers to concepts of pure experience and basho. Though, with a focus on organizational knowledge creation he used these concepts in a modified, practical sense which led him to a similar, but still deviant approach.

For Nonaka, future-building knowledge creation is a self-transcending process (Nonaka, Toyama & Konno 2000, p.8) where knowledge visions serve as a self-transcending objective aimed at getting the organization to surpass itself (Nonaka et al. 2008, p.28). Personal subjective knowledge is validated socially and synthesized with others' knowledge so that knowledge keeps expanding in the upward spiral. Individuals interact with each other to reach out beyond the boundaries of their own existence and transcend the old self into a new self by acquiring a new context, a new view of the world and new knowledge, and as a result, change themselves, others, the organization and the environment (Nonaka & Toyama 2005, pp.421–422). The factor that **drives the knowledge spiral** and promotes the synthesis of tacit and explicit knowledge, is **phronetic leadership**. Understanding phronesis as a **third type of knowledge**, Nonaka calls the synthesis of all three types of knowledge the 'knowledge triad' relationship. (Nonaka et al. 2014, p.3)



Fig. 4.2: The Knowledge Triad (Nonaka et al. 2014, p.3)

When laying the ground for this knowledge-based management theory (see chapter 2.2.2) Nonaka referred to Nishida, Heidegger and the notion of pure experience in conceptualizing ‘**socialization**’ (the sharing of tacit knowledge in joint activities) and its attributed ‘**originating ba**’ (the start of the SECI knowledge spiral): “Here, Nishida’s concept of ‘pure experience’ is important. [...] Self-transcendence is fundamental to sharing individual tacit knowledge”. (Nonaka & Konno 1998, p.42) “Originating ba is the primary ba from which the knowledge-creation process begins and represents the socialization phase. Physical face-to-face experiences are the key to conversion and transfer of tacit knowledge. Pure experiences, ecstasy, or ‘being thrown into the world’ (Heidegger) are philosophical terms to describe this. Organizational issues that are closely related to originating ba are knowledge vision and culture.” (Nonaka & Konno 1998, p.46)

In his further work Nonaka refers to a more general terminus ‘**direct experience**’ and focuses on the quality of self-transcendence: “knowledge creation is a self-transcending process, in which one reaches out beyond the boundaries of one’s own existence. In knowledge creation, one transcends the boundary between self and other, inside and outside, past and present. In socialization, self-transcendence is fundamental because tacit knowledge can only be shared through direct experiences which go beyond individuals.” (Nonaka, Toyama & Konno 2000, p.13)

Nishida conceptualized basho or ba as a field of reflexive awareness that is characterized by a certain individual cognitive quality and that in its ultimate form results in pure experience. Divergent from that, Nonaka redefined basho or ba as “shared context in motion, in which knowledge is shared, created and utilized”. This definition results in a different

interpretation of the ultimate Basho of Absolute Nothingness: “To participate in *ba* means to get involved and transcend one’s own limited perspective. Nishida states that the essence of *ba* is ‘nothingness’. [...] It means that at *ba*, one exists in the relationship with others, instead of as an atomistic and absolute ‘self’.” (Nonaka & Toyama 2005, p.428)

Nonetheless, when formulating his concept of phronesis and phronetic leadership, Nonaka integrates Nishida’s ideas about the quality of the ultimate basho when giving details on cognitive qualities of phronesis and phronetic experience. Phronesis is characterized by ‘contemplation in action’ – thinking things through while engaged in activity – and quick judgement within a context with timely balance maintaining standards of common good. (Nonaka et al. 2014, p.3) Phronesis is described as the ability to synthesize a general, universal knowledge with the particular knowledge of a concrete situation, to **grasp the essence** of particular situations and things. (Nonaka & Toyama 2007, p.380)

In detail, within Nonaka’s six abilities that constitute phronesis, there are two abilities that refer to Nishida’s cognitive qualities of basho:

- No 2: ability to share contexts with others and to create *ba*.

This includes the ability to **transcend one’s own limited perspective** and to ‘read’ a situation and adapt to it quickly. (Nonaka & Toyama 2007, pp.381–382)

- No 3: ability to grasp the essence of particular situations/things.

“Seeing essence is the ability to fathom intuitively the true nature and meaning of people, things and events. It is the ability to quickly sense what lies behind phenomena and accurately project an image of the future based on this intuition. By recognizing the situation correctly and grasping the essence, one can **envision the future** and decide on the action to be taken to realize that future. To do this, one has to be able to see at both the micro and the macro levels simultaneously. [...] the **kind of consciousness that enables one to sense truth in individual details** is the starting point of creativity. [...]

When one is able to **perceive universality through experience**, to see the forest and the trees simultaneously, that is a phronetic experience. Phronesis enables one to perceive beyond the ordinary to see essence.” (Nonaka & Toyama 2007, pp.382–383)

Thus, epistemological roots of Scharmer’s concept – basho as three-level reflexive awareness with the ultimate basho or pure experience being both the highest awareness

and the ultimate ground for consciousness and creativity - is used also by Nonaka, but in a different, twofold way:

- Nishida's originating qualities of the ultimate basho/pure experience can be found within the kind of cognition described by 'phronetic experience' or 'grasping the essence'. In envisioning future potential, simultaneous perception of micro and macro levels, intuition and imagination play an essential role.
- The basic notion of 'basho' or 'ba' is used to denote a multilayered physical, mental or cognitive place or space which enables connection to others in a certain quality so that individuals can transcend their boundaries. To transcend the self is meant to be "to connect to others", "to be involved" and 'ba' is the locus for this (Nonaka & Toyama 2007, p.382) Face-to-face experiences are the ones which Nonaka connects to pure experience, ecstasy, or vision processes (Nonaka & Konno 1998, p.46) These are especially essential within the socialization phase to build an 'originating ba' or 'primary ba' as starting point for creativity.

4.4 Common Ground and Characteristics

If we compare Scharmer's self-transcending knowledge and Nonaka's concept of phronesis we can derive four elements which are characteristic and essential to both approaches even though used with a different focus: emergent self-transcendence, high-quality cognition, connection with a space called field or ba, and relating knowledge to an act of creation. (see table 4.2).

Emergent Self-transcendence

When Scharmer refers to self-transcendence, he speaks of a transcendence of "the current self toward the most ultimate common ground (source) that is prior to subject/object distinctions"(Scharmer 2001, p.143). This corresponds with Nishida's third basho which "moves attention from the self and self-consciousness to acts of consciousness in which the self is no longer the focus" (Scharmer 2001, p.143). It is a "state of mind that transcends the distinctions [...] between knowing and acting" (Scharmer 2001, p.141). The knower

experiences “a type of cognition which is beyond usual downloading of mental frames” (Scharmer 2007b, p.33).

<i>Characteristic</i>	Self-transcending Knowledge (Scharmer) "not-yet-embodied tacit knowledge"	Phronesis (Nonaka) "high-quality tacit knowledge"
Emergent Self-transcendence	state of consciousness reflection transforms mind <div style="text-align: center;"> </div> -> cognitive self-transcendence Western "I" perspective	state of connectedness interaction transforms mind <div style="text-align: center;"> </div> -> affective self-transcendence Eastern "we" perspective
High-quality Cognition	aesthetic/pure experience reflection in action self perceives of it while acting -> reflection in action	face-to-face phronetic/direct experience macro in micro seeing universal truth in details -> grasping essence
Space of Connection	'field' of potential field of reflexive awareness -> connection to source certain state of mind (no self) enabling certain state of connectedness (to source)	'ba' - shared context in motion context for new perspectives -> connection to others certain state of connectedness (to others) enabling certain state of mind (new perspective)
Creation Process	actualizing highest potential	new futures by inductive jumps

Tab. 4.2: Characteristics of Self-transcending Knowledge Concepts

Thus, Scharmer focuses on the aspects of self-transcendence which relate to certain **thought conditions**, i.e. qualities of attention, consciousness, state of mind or types of cognition. These can be approached by techniques of heightening attention, like presencing, deep reflection, meditation, etc., be it individually or collectively. For Scharmer, self-transcendence is a **state of consciousness** and the means is **reflection which transforms the mind**, no matter if individually or collectively.

When Nonaka refers to self-transcendence, he speaks of reaching “out beyond the boundaries of one’s own existence”, transcending “the boundary between self and other, inside and outside, past and present” (Nonaka, Toyama & Konno 2000, p.13). It is about transcending “the old self into a new self by acquiring a new context a new view of the world and new knowledge” (Nonaka & Toyama 2005, pp.421–422), to make “direct experiences

which go beyond individuals” (Nonaka, Toyama & Konno 2000, p.13), to “connect to others” (Nonaka & Toyama 2007, p.382).

Thus, Nonaka focuses on the aspects of self-transcendence which relate to certain conditions of connection with other individuals. These can be approached by techniques of interaction, like dialoguing and practicing together. For Nonaka, self-transcendence is a **state of connectedness**. The means is **interaction within a collective which transforms the mind**, no matter if consciously or unconsciously.

Conn (1998) describes various forms of self-transcendence. He proposes that every person has a radical desire “to reach out, to move beyond, to transcend the self” and that this desire “is at the source of everything that is specifically human” and is “realized in every genuine instance of creative understanding” (Conn 1998, pp.323–324). This radical desire for self-transcendence can be expressed in various ways. In cases where it relates to the unfolding of distinct levels of consciousness, Conn speaks of ‘**cognitive self-transcendence**’. In cases where it relates to the overcoming of the individual’s isolation and spontaneous acts are not just for oneself but also for the good of others, he speaks of ‘**affective self-transcendence**’ (Conn 1998, pp.325–326). Following this, Scharmer’s understanding of self-transcendence will be referred to as cognitive self-transcendence, while Nonaka’s understanding of self-transcendence will be referred to as affective self-transcendence.

As both concepts agree on the emergent character of knowledge, the notion of emergence is key to both, Scharmer’s self-transcending knowledge as well as Nonaka’s phronesis. Nevertheless, there are slight differences in the main use of the terminus arising from their conceptual differences with regard to self-transcendence as discussed above.

Scharmer mainly uses the term in connection with the emergence of the future, reality, opportunities, potentials etc. It is used to describe the creative process as such, where something new “wants to emerge” or “being emerges out of nothing” (Scharmer 2001, pp.139, 142). Thus, the new emerges out of a field of potential.

Nonaka, when using the term emergence, refers to the emergence of relationships in ba, and the emergence of ba itself. Thus, the field of potential emerges out of relationships.

Yet, both authors have missed to deeper explore the concept of emergence. In search for a theoretical model for collective self-transcending knowledge, the concept of emergence will be further explored within chapter 7.3.

High-Quality Cognition

Scharmer as well as Nonaka describe a shift in consciousness which moves beyond usual perception. Scharmer describes the certain state of consciousness, the certain type of cognition relating to self-transcending knowledge as ‘improved quality of experience, awareness, thought’, ‘aesthetic experience’, ‘pure experience’, ‘primary knowing’, ‘deep awareness’ or ‘type of cognition beyond usual downloading’, ‘acting intuition’, ‘reflection in action’ or ‘intuition in action’ where the “self conceives of it while acting” and there is a “zero feedback delay” or “synchronicity between action and reflection”.

Nonaka describes the type of cognition relating to phronetic experiences as “grasping the essence of situations and things [...] envisioning how it relates to the larger context”, to “see at both the micro and the macro levels simultaneously”. It requires a “kind of consciousness that enables one to sense truth in individual details”, to “perceive universality through experience”, to “see the forest and the trees simultaneously”, to “perceive beyond the ordinary to see essence”, to ‘read’ a situation and adapt to it quickly.

Space of Connection

When Scharmer refers to basho or ba, he refers to the three-level fields of reflexive awareness as established by Nishida. He locates self-transcending knowledge at the highest level of basho, which he describes as connection to the source or the ultimate ground. It is the source of creativity or the field of potential where the new comes into being. Instead of taking over the ‘ba’ terminology from Nishida, he borrows from Rosh and uses the notion of ‘field’ throughout his work. Access to this field happens through presencing, to become fully present in the now.

Thus, for Scharmer, ba or field is a space of connection, rather connoting a **connection to the source** or to the inner, true self resulting in cognitive self-transcendence as described above. The focus is on ba or field as a locus of a certain **state of consciousness/mind**

enabling a certain state of connection (to the source). We encounter this idea in Polanyi's work on tacit knowledge as "pre-logical phase of knowing" (Virtanen 2013, p.125), in Gueldenberg and Helting's "pre-theoretical, pre-propositional field" which provides the fertile ground for phenomena to emerge (Gueldenberg & Helting 2007, p.118), or in James' "non-conceptual aboriginal field" (Krueger 2007, p.2)

When Nonaka refers to ba, he refers to a physical, mental, cognitive place or space, a 'shared context in motion'. Participation in ba means 'to get involved' and to transcend the own perspective. Individuals exist in connection with others, instead of atomic, absolute self. Especially the primary ba, the start of the knowledge spiral, requires physical face-to-face experience. It is a context for sharing where new perspectives arise. Also for Nonaka, a 'here-and-now-quality' (Nonaka, Toyama & Konno 2000, p.15) is characteristic: "Ba is a process of indwelling in a 'here-now' situation that transcends time and space." (Nonaka et al. 2008, p.40)

Thus, for Nonaka, ba is a space of connection and sharing, rather connoting a **connection to others**, resulting in an affective self-transcendence as described above. Although he does not reduce ba to physical ba but includes the attributes mental and cognitive in its definition, Nonaka's own explanations, but even more the practical interpretations of his model, mainly focus on the connection of individuals while losing sight of mental and cognitive forms of connection. It focuses on joint experiences of individuals when interacting, not on interaction with the own states of mind. It highlights physical or virtual bringing together which leads to transcendence of individual perspectives. The focus is on ba as a locus of a certain **state of connectedness (to others) which enables a certain state of mind (a new perspective).**

Creation Process

For Scharmer, generating self-transcending knowledge is a creative act that actualizes the highest potential of parties involved: individuals, groups, or society as a whole. When Scharmer refers to this creative process he speaks of 'seizing', 'actualizing' or **'presencing'** the emerging future and its highest potential, of 'seeing things before they manifest' of 'intuiting form'. Thus, without neglecting the active side, he nonetheless highlights the **passive part** of the creative process which has to do rather with **conception**: reaction on or

reception of something that wants to evolve. His method of presencing focuses on the mental states which best enable the activation of senses for conception or **inspiration as a ground for intuition**.

For Nonaka, phronesis is a high quality tacit knowledge that enables one to undertake the best action in a specific situation to serve the common good. New futures are created by inductive jumps and leaps into tomorrow. When Nonaka refers to this future-creating process, he speaks of intuition as 'sensing what lies behind phenomena' as 'grasping the essence'. This forms the basis for projecting an image of the future, for **envisioning the future**. This vision again is where to start from decisions on the action to be taken to realize that future. Thus, without neglecting the passive side, Nonaka focuses on the **active part** of the creative process which rather has to do with **gestation and delivery: active imagination** and its following actions.

Peschl and Fundneider describe the creative act closely related to self-transcending knowledge as shifting an object or phenomenon from being in a state of '**in potentia**' into **being 'in actu'**. Something which is 'in potentia' is something which is not directly visible yet, but hidden. It is already there as a germ, it is there in potentiality. It is something which wants to break forth, but which is highly fragile and too weak to break forth by itself in most cases. (Peschl & Fundneider 2011, pp.45–46)

4.5 Summary

Future-building, self-transcending knowledge is characterized by the emergence of self-transcendence, a high quality of perception and cognition which is referred to as 'pure' or 'direct' experience, and creation processes that happen in spaces of connection.

If we consider the characteristics of Scharmer's and Nonaka's concepts as discussed above, we recognise that Scharmer focused on **thought conditions of individuals as access lever** to start with and the question seems to be how to shift this cognitive self-transcendence on a collective level. Scharmer himself did not deliver a corresponding theory or infrastructure that enables the heightened state of attention specifically on collective level. On the other hand, Nonaka focused on collective processes of knowledge generation identifying the

conditions of connecting individuals as access lever, so the question seems to be how to shift these processes on a qualitatively higher level with respect to the cognition of each individual and the collective as a whole. Yet, Nonaka never refers to individual cognitive practices but thinks of phronesis as being already embedded in individuals which just need to be transferred through interaction (Nonaka & Toyama 2007, p.385).

The question under research, i.e. how to generate collective self-transcendence, seems to be the same as the question of how to integrate Scharmer's and Nonaka's approach of self-transcendence, i.e. how to **integrate cognitive and affective self-transcendence**. A theory for understanding collective self-transcending knowledge needs to encompass both of these forms of self-transcendence: on the one hand the transition from ordinary day-to-day cognition to levels of pure experience and higher quality of thoughts, and on the other hand the transition from individual to collective cognition. The first deals with various forms of reflection, raised awareness and individual learning, the second deals with forms of connections and networks. As we will see in chapter 7, there are reciprocal feedback loops between them.

After having discussed the notions of knowledge and learning in chapter 3 and the specific concept of self-transcending knowledge in this chapter 4, the next chapter 5 will develop a theoretical model for learning from the future with respect to Scharmer's concept focusing on cognitive self-transcendence. Correspondingly, chapter 6 will discuss concepts of collective knowledge and cognition. In chapter 7 this will then be followed by a definition and modelling of collective knowledge and finally collective self-transcending knowledge, which includes affective self-transcendence.

5 A Model of Self-transcending Knowledge and Learning from the Future

Hodgkinson et al. (Hodgkinson et al. 2009, p.277) observed that recent advances in social cognitive neuroscience and related fields have rejuvenated scholarly research into intuition and consider the implications of these developments for understanding managerial and organizational decision-making. Although well accepted and referred to within organizational change activities, so far there have been few efforts in theorizing intuition. This chapter will make a step into this direction. Its aim is to approach a theoretical understanding of learning from the future by rooting it within constructivist epistemology and learning theory as presented in chapter 3.2. Four conceptual elements suitable for underpinning theoretical understanding of learning from the future are derived from them:

- (1) Knowledge is constructed by sense-making in the form of cognitively relating differences, based on awareness of subsidiaries and attention to focus. Learning manifests in the progress of this process.
- (2) There are four modes of learning to accomplish the process.
- (3) There are three levels of reflection available.
- (4) Mental objects to learn from can refer to past, present or future.

In the following, these elements will be developed in detail in chapters 5.1 to 5.4 before they are used to present an integrated model of self-transcending knowledge and learning from the future in chapter 5.5.

5.1 Knowledge as Construction of Sense

Following Krippendorff's epistemology for communication as described in chapter 3.1.1, cognition manifests through creative acts of drawing distinctions and formulating relations within a **hermeneutic circle**.

The hermeneutic circle was originally conceived in terms of the relationship between the parts and the whole of a text, later extended to the text's relationship to historical tradition and culture: Our understanding of the parts hinges on our understanding of a larger whole, which again, can only be understood on the basis of the parts. There exists a mutual

relationship between the text as a whole and its individual parts, or between the text and its historical context. It was Heidegger, who made the ‘ontological turn’ and referred the hermeneutic circle to the interplay between our self-understanding and our understanding of the world. (Ramberg & Gjesdal 2013)

Heidegger’s student Gadamer developed a version of the hermeneutic circle which gives useful insight for the process of sense-making by distinguishing and relating: Understanding of a text builds by a ‘**dialogical relationship**’ with the past and a ‘**fusion of horizons**’. In **building** understanding for what first appears alien, “we **participate in the production of a richer, more encompassing context of meaning**”. In Gadamer’s version of the hermeneutic circle, text and reader are co-determined. Reading itself contributes to the text’s effective history, thus to its meaning. “In the fusion of horizons, the initial appearance of distance and alienness does itself emerge as a function of the limitations of our own initial point of departure.” (Ramberg & Gjesdal 2013)

Thus, we can understand the individual hermeneutic circle of cognition and sense-making as co-determination between an experience and the experiencing individual (figure 5.1) This circular cognitive process is triggered by ‘incomprehensible sensations’, thus perception of differences (t) that disturb the hitherto functional harmony between observations and understanding (x), and converges towards a new, again sufficient coherent, but more encompassing understanding and sense.

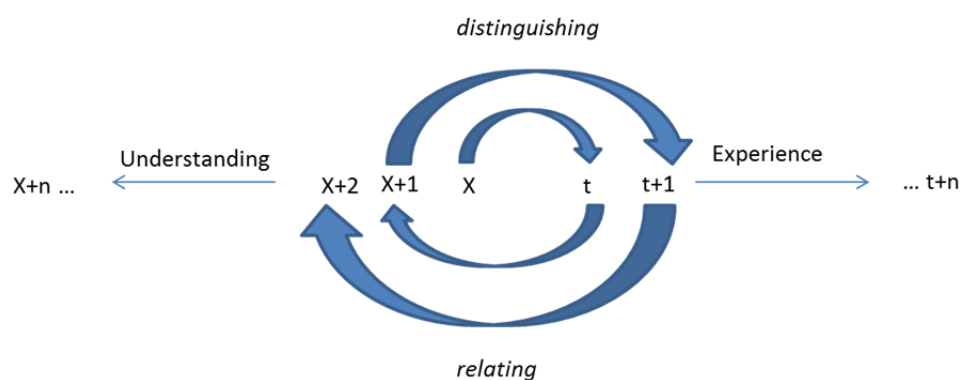


Fig. 5.1: Hermeneutic Circle of Cognition and Sense-making

Similarly, Weick describes sense-making as the experience of being thrown into an ongoing, unknowable, unpredictable stream of experience in search of answers to the questions,

“what’s the story?” and “what do I do next?” (Weick et al. 2005, p.410) All sense-making starts with chaos as it occurs within a stream of potential antecedents and consequences. **Noticing** and **bracketing** – extracting certain cues for closer attention - form the incipient state of sense-making. Phenomena are “carved out of the undifferentiated flux of raw experience” and then **conceptually labeled** so that they can become the ‘common currency for communicational exchanges’ and stabilize the stream of experience. **Conceptual cognitive representations** are deployed in such ways that they generate recurring behaviors. (Weick et al. 2005, p.411)

Kolb’s theory of learning from experience as presented in chapter 3.2.2 corresponds with the idea of the constructivist hermeneutic circle: He describes learning and knowledge as in permanent flow of adaptation, manifesting in the present moment so that any outcome of learning is at the very moment already historical record, not knowledge of the future. Knowledge is created in a permanent process of grasping experience that violates expectation (differences) and its transformation (relating). There are two modes of each - grasping and transforming experience - and conceptualization is viewed as one mode of grasping experience.

Knowledge processes are based on existing knowledge and at the same time transcend this knowledge. As portrayed in chapter 3.1.2, knowledge results from content of focal awareness which gains personal meaning by integrating it with contents of existing subsidiary awareness. Thus, in order to **increase qualities of knowledge processes towards self-transcending knowledge**, we can derive three points of leverage:

- (1) Expansion of capacity of focal awareness by increased perception and distinction making
- (2) Focus on contents of subsidiary (hitherto non-focal) awareness, thus its variation
- (3) Increased quantity and quality in cognitive capabilities of association and relating

5.2 Integration of Four Modes of Learning

Scharmer’s and Nonaka’s concepts of future-building knowledge describe such an expansion of focal awareness and increase in cognitive qualities:

- Scharmer's self-transcending knowledge and learning from the future is characterized by a certain kind of cognitive state with heightened attention called '**reflection in action**'. The focal cognitive space is expanded to encompass simultaneously reflection *and* action. There is no delay between action and reflection but synchronicity between both. The border between subject and object blurs so that subjective action and objective observation forms a unity.
- Accordingly, Nonaka's concept of phronesis rests on a certain type of cognition that enables '**grasping the essence**' of situations by perceiving universality through experience, to sense truth in details. Here, the focal cognitive space is expanded to encompass simultaneously concrete details and abstractions of the big picture.

In Kolb's model, integration of the four modes of learning through simultaneous application characterizes highest levels of learning resulting in true creativity and growth. Thus, it is proposed that

- the type of cognition denoted '**grasping the essence**' corresponds with the synthesis of Kolb's two modes of grasping experience which are '**concrete experience**' (CE) and '**abstract conceptualization**' (AC). This will be referred to as the '**expanding**' **dimension** of high-quality cognition.
- the kind of cognitive state denoted '**reflection-in-action**' corresponds with the synthesis of Kolb's two modes of transforming experience which are '**reflective observation**' (RO) and '**active experimentation**' (AE). This will be referred to as the '**relating**' **dimension** of high-quality cognition.

Grasping experience by abstract conceptualization is what Weick & Sutcliffe (2006) call being in the '**conceptual mode**' of **perception**. Here, people develop knowledge by description rather than acquaintance. Their cognitive processing is **schema driven** rather than **stimulus driven**. They go beyond the given information and elaborate their direct perceptions into types, categories, stereotypes, and schemas that mobilize habitual action. It is contrasted with the **mode of direct perception**, which can be compared to grasping experience by non-conceptual, concrete experience. Here, people develop knowledge of acquaintance through active, hands-on exploration. There is bottom-up stimulus-driven **cognitive processing concurrent with acting** (Weick & Sutcliffe 2006, p.520), which on the other hand manifests reflection-in-action.

Weick argues that synthesis of conceptual and direct mode of perception is reached by an infinitely rich awareness of discriminatory detail where an infinite number of concepts turns into non-conceptuality. He proposes that there is a **continuum of distinction making**, with conceptual routine-following (few to no new distinctions) at one end and non-conceptual living (infinite number of concepts/categories/routines) at the other end. When distinctions multiply, conceptual categories and routines become less and less distinguishable from simply acting here and now to what is seen. When people enrich the distinctions they make, their efforts begin to resemble mindful practices and their experience becomes less mediated by concepts and more non-conceptual. They become more aware of the process of distinction making itself and how conceptualization itself interferes with seeing. (Weick & Sutcliffe 2006, pp.517, 522)

In other words, synthesis of direct and conceptual perception as two forms of grasping experience and reflection and action as two forms of transforming experience are based on an enriched awareness of discriminatory detail by (Weick & Sutcliffe 2006, pp.516–518)

- (1) an increase in **quantity and creativity in distinction making**, i.e. in encoding ambiguous outcomes into concepts and routines, *and*
- (2) an increase in **quality in distinction making** by focusing on the introspection of the distinction making process itself.

Rich awareness of discriminatory detail is diminished by ‘wobbling’ perception and ‘normalizing’. Normalizing describes a form of associative thinking which easily accepts conceptual associations before total awareness can occur, so that differences are ignored or easily put into known concepts. (Weick & Sutcliffe 2006, pp.516–517) Therefore mindfulness is of dual importance for rich awareness of discriminatory detail: on the one hand to enrich quantity of attention for encoding and matching situations with routine, and on the other hand to enrich quality of attention which manifests in ‘anomalizing’ or reversal of normalizing: the grasping of unique particulars, i.e., differences, nuances, discrepancies, and outliers that **slow the speed** with which details are normalized and **foreshadow potential problems and opportunities**. (Weick & Sutcliffe 2006, p.518)

Thus, mindfulness is not only needed for its ability to stir up what is taken for granted but also for its ability to **discipline attention and make it a more powerful tool for modification of conceptualizing**. To be more mindful is to **attend with greater stability and vividness**, and

to watch how concepts are built and function in the mind and what happens when dependence on concepts decreases. (Weick & Sutcliffe 2006, pp.518–520) Mindfulness is a tool which on the one hand uses increased conceptuality but on the other hand **transcends conceptuality by increasing awareness of the act of conceptualization itself**.

This is what Tsoukas describes as getting in touch with reality through ‘**knowing from within**’ or ‘seeing instead of thinking’ which means to place ourselves at the center of an unfolding phenomenon. In this perception we are responsive to differences instead of obliterating them through concepts. (Tsoukas 2005b, pp.188–189)

5.3 Integration of Three Levels of Reflection

According to Starr and Torbert, transconceptual experiences enable **triple-loop-learning** as the individual needs to be simultaneously aware of all territories of experience – of the outside world, one’s own behavior, one’s own feelings and thoughts, and at the same time, a kind of witnessing of all this. (Starr & Torbert 2005, p.87)

To create something profound new, the three loops or levels of learning and reflection need to recursively interfere: behavioral reflection as processes of redesign and adaptation in patterns of behavior, cognitive reflection as processes of reframing sets of premises and assumptions, and existential reflection as third level of reflection which touches the domain of ‘the self’ beyond personality and brings a person’s acting, cognition and intention/will into an inner unity with itself and with future potential and requirements.

Within the concept of self-transcending knowledge, Scharmer refers to Nishida’s three bashos of reflexive awareness with the highest level of pure experience resulting in the highest level of learning. Learning from the future is defined by sensing and connecting with the (highest) future potential, dropping non-essential aspects of the self. Thus, it is proposed to **view learning from the future as triple-loop learning** with the three levels of learning and reflection representing the three bashos of reflexive awareness.

5.4 Integration of Retrospect and Prospect

Following Scharmer, the highest level of learning from the future – presencing - occurs, when perception begins to connect to the source of our emerging future. The boundaries between **three types of presence collapse**: the presence of the past, the presence of the future, and the presence of one’s authentic Self (Scharmer 2009, p.165), so that people ‘operate from a future space of possibility’, in which they open themselves to new aspects of their highest possible future self. Gunnlaugson describes this as learning from attention to what is emerging (Gunnlaugson 2007, p.141). Chia defines it as ‘foresight’, to “intuit an as-yet unformulated problem or to perceive an opportunity that is still hidden, inarticulate, or not yet revealed“ (Chia 2004, p.30)

Seligman et al. (2013) give evidence that “prospection is a central organizing feature of perception, cognition, [...] and action”. It involves guidance by present representations of possible future states, not by the future itself which would imply backward causation (Seligman et al. 2013, p.119). Also Polanyi accepted intuitions not only as valid, but also as necessary elements of knowing (Virtanen 2013, p.125)

The integrative application of both retrospect and prospect within sense-making has been formulated by Weick: When a situation or an event is labeled as an answer to the question ‘what’s the story’, the situation or event has already advanced and the label fails to represent the dynamics of what is happening. The ‘now’ of labeling with hindsight collides with the ‘then’ of acting with uncertain knowledge into the unknown emerging future. So the second question of sense-making “**what do I do next?**” comes in. People make sense “by **acting thoughtfully**, which means that they **simultaneously interpret their knowledge with trusted frameworks**, yet mistrust those very same frameworks by testing new frameworks and new interpretations. [...] ignorance and knowledge coexists, which means that adaptive **sense-making both honors and rejects the past**. (Weick et al. 2005, p.412) It mixtures retrospect and prospect: While answers to the question “what’s the story?” emerge from retrospect and connections with past experience, answers to the question “now what?” emerge from presumptions about the future, articulation concurrent with action, and projects that become increasingly clear as they unfold. (Weick et al. 2005, p.413)

Based on recent advances in social cognitive neuroscience, Hodgkinson et al. (2009) developed an integrative account on intuitive decision-making in organizations, which adds the aspect of 'informed intuition' in contrast to 'naïve intuition' to the understanding of sensing and seizing the future. **Informed intuitions** in contrast to naïve intuitions are 'compressed' analyses based on perception, recognition and awareness built on learning, experience and feedback. Hodgkinson borrows from the Recognition Primed Decision model (RPD) in naturalistic decision-making, proposing that decision-makers identify a course of action (**recognition**) and accept or reject that course of action on the basis of a forward projection via mental simulation (**affect**). In doing so, **accumulated domain-relevant expertise** enables people to develop complex domain-relevant mental representations [...] which afford them not only a highly-tuned awareness of the situation, but also the capability to pattern match, in order to sense when something is 'out-of-kilter' and intuitively know what actions to perform." (Hodgkinson et al. 2009, p.283). Similarly, Johannessen and Olsen argue that a higher level of experience provides a **higher potential for creativity**. People do not need to adhere to rules but can rely on their **expertise while still showing normative and cognitive openness**. (Johannessen & Olsen 2011, p.154)

Distinguishing it from instinct (reflex actions) and insight ('eureka moment': sudden, unexpected solution after impasse and incubation), Hodgkinson describes intuition as something that may presage the insightful moment: "intuitions are intimations of **insights experienced** as 'feeling of knowing' or 'tip of the tongue' phenomena", but "not all intuitions become insights". (Hodgkinson et al. 2009, p.279) Intuitions are subjective, experientially rooted judgments for a given course of action that come to mind with an aura of rightness but without clearly articulated reasons. They arise as signals from the interior through **rapid, non-conscious holistic associations** or novel and unexpected connections among concepts, founded on largely tacit ways of knowing – "essentially 'knowing' but without knowing why" (Hodgkinson et al. 2009, p.279,280,290). According to Korthagen, these transmitted images or perceptions of relations between things can come in two ways: as "sudden, intuitive 'flashes', brief moments of deeper insight" or as "a more stable capacity to act on the basis of a deeper knowing, a realization of the larger whole of which the decision in question is only one part". (Korthagen 2005, p.376)

Thus, skilled decision-making requires **cognitive versatility**, i.e. appreciation of important **analytical details while maintaining an intuitive bigger picture**. While ‘detail conscious’ individuals may become overburdened by the demands of a situation as they cannot see the bigger picture, and ‘big picture conscious’ individuals may overlook vital information, ‘cognitively versatile’ individuals are able to “equally processing detail and cutting through such detail to intuit a broader perspective”. (Hodgkinson et al. 2009, p.288) Similarly, Korthagen propose to see “intuition as a process taking place within a human being when the I-boundary is (temporarily) extended beyond the personality, and the individual is able to see beyond his or her ego-restricted thinking. The individual is briefly in contact with a larger whole, and is able to observe the *implicate* order in things.” (Korthagen 2005, p.379) **Intuition and analytical reflection** are qualities **complementing each other** as analytical reflection plays an important role in giving shape to intuition and working out the insights gained through it, thus “going **from inspiration to creation**”. (Korthagen 2005, p.380)

In search of a model of self-transcending knowledge we can summarize the following for a third, a **‘creating’ dimension** of its high-quality cognition:

- Any sense-making circle mixtures prospect and retrospect. It represents a specific case of cognitive distinguishing and relating (connecting images of the future with past and present).
- The **proportion between prospect and retrospect**, determines **coherence of continuity and transformation**, thus, whether subsequent action follows routine or allows for radical novelty up to chaos.
- The **quality of prospect** and the quality of relating it to past and present determines whether we call it intuition or imagination. We call it intuition when relating happens rather quick and unconscious and occurs as tacit association.
- Quality of prospect is increased by synthesis of learning modes as describes above: integration of details and broader perspective (‘cognitive versatility’) as well as extension of the subject’s cognitive boundary beyond personal thinking. As stated by Vince (1998, p.306), learning can occur either from individuals’ rationality or their emotional reality, though, the outcome may be of different quality.
- Quality of relating and associations is improved by domain-relevant expertise.

Sensing and perceiving future possibilities can be understood as what Kolb refers to as interacting with 'mental objects'. Visions or images of a desirable future represent a kind of mental object in focal awareness that – in interaction with individual needs and desires in subsidiary awareness – form an experience to learn from in the present now. It is rather an 'experiencing the future in the now' than an 'experience of the future'. Scharmer describes learning from the future as a particular way of experiencing the present moment. The learner always resides in the present moment and learning processes always happen in the now. Yet, mental objects to interact with can refer to the past, the present or the future.

However, 'experiencing' the future can be of highly different quality. The impact that prospect can unfold within the sense-making process is highly dependent on whether emotional reality is included. Senge expresses this as follows: "Not all visions are equal. Some [...] [are] good ideas that unleash no energy for change. Others transform the world. [...] There's nothing more personal than vision, yet the visions that ultimately prove transformation have nothing to do with us as individuals." (Senge et al. 2004, p.131) "The visions that arise out of genuine presencing come from 'the field knowing itself', a spontaneous expression of discovering the power to shape our reality and our responsibility to an emerging future. [...] Only when people begin to see from within the forces that shape their reality and to see their part in how those forces might evolve does vision become powerful. Everything else is just a vague hope." (Senge et al. 2004, p.132) "Real visions are uncovered, not manufactured." (Senge et al. 2004, p.133)

5.5 Integrated Model of Self-transcending Knowledge

When integrating the elements discussed above we can derive a theoretical model of self-transcending knowledge and learning from the future as follows (see figure 5.2):

Abilities of grasping and transforming experience span the matrix of learning styles as in Kolb's model. In the specific case of learning from the future, grasping experience contains a **considerable share of prospect** as experiencing the future by interacting with conditions that constitute an environment relating to the future. Intuition or imagination that deeply involves an aesthetic reality could be examples of concretely experiencing the future (CE).

Pure mental imagination, e.g. by rational analysis could be an example of abstract conceptualization of the future (AC).

Both axes, grasping and transforming, imply a time dimension indicating the timely difference between involvement (CE) and detachment (AC), respectively between action (AE) and reflection (RO) in a learning process. Following Kolb, the **highest level of learning** - true creativity – is given in the **geographical center** of the matrix when all four modes are simultaneously applied.

Considering the grasping axis, learning from the future is of higher quality the more concrete aesthetic situations and perception of universal, thus abstract concepts, converge. The most effective and highest level occurs when there is no time delay between concrete experience and conceptualization, when the essence is grasped simultaneously with experiencing the details, corresponding with Nonaka's phronetic experience or Weick's **transconceptuality**.

Considering the transforming axis, learning from the future is of higher quality the more reflection and action converge, corresponding with Scharmer's **reflection-in-action**. The geographical center of the matrix where all four modes are applied simultaneously, where phronetic experience and reflection-in-action meet, characterizes the highest form of pure experience where perception happens from the third basho of Absolute Nothingness.

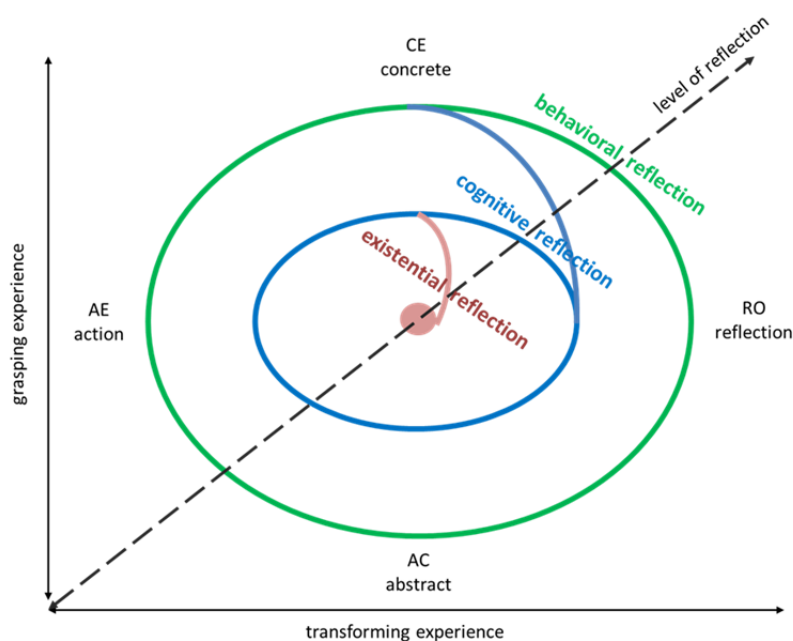


Fig. 5.2: Model of Learning from the Emerging Future

A third axis is introduced to indicate the **three levels of reflection** which constitute the three levels of reflexive awareness. The lowest level of reflection – behavioral reflection – constitutes paradigm-constrained learning processes (green, single loop) without reference to the observer or learner himself. Additional consideration of cognitive reflection, takes the learning process onto the next higher, paradigm-breaking level. Significance and role of the self is raised into the learner's awareness and included in the learning process (green-blue double loop). Finally, existential reflection guides the learning process to the highest point of the learning spiral, the inner unity of acting, cognition and intention with itself and with highest potential (green-blue-red triple loop). All three levels are intertwined and interdependent and are the means to shift richness of awareness to another level. Higher levels of reflection require **higher quantity and quality of attention** and correspond with **higher levels of integration**, thus **higher quality of cognition** where modes of grasping and transforming experience gradually converge.

It is important to note that the spiral depicted in figure 5.2 does not show the hermeneutic circle itself but a matrix of four quadrants of qualities in which the hermeneutic circle can be performed, as a result of combining modes of grasping and transforming experience. The three axes represent the **three dimensions of high-quality cognition**: expanding quality of grasping experience, relating quality of transforming experience and creating quality of reflection determining balance between retrospect and prospect in acting. Higher levels of reflection and learning represent higher levels of convergence between grasping modes on the one hand and transforming modes on the other hand, until they have been integrated in the center of the matrix. This center is characterized by a **three-fold cognitive integration along the expanding, relating and creating dimension of high-quality cognition**. It represents a certain type of cognition where distinguishing differences and their relating happens simultaneously, thus in a strong sense, **cognition itself is transcended towards 'transconceptuality'**.

As Kolb already mentioned, this ideal of synthesis seems to be difficult to achieve. Thus, in practice learning from the future comes in **various forms**, dependent on the choice the learner makes on the dialectical conflicts between learning modes and prospect and retrospect. For example, cognitive reflection on an abstract vision concept, detaches from action, also constitutes learning from the future, using the learning style of assimilating.

However, it lacks energy from concrete experience, thus not sparking true creativity. Following Kolb and Argyris, the quality of learning is also dependent on the extent to which an experience 'violates' expectation, thus, is considerable different from the known. Otherwise, learning is not necessary and not triggered. Similarly, Kolb and Peschl suggest that growth for the highest potential cannot be realized if experience is close to expectation. Thus, the quality of learning from experiencing the future is especially powerful when prospect used within sense-making is considerable different from the present, thus enables the creation of something radical new.

To summarize, Kolb's model of learning from experience together with models of loops or levels of learning offer a theoretical platform for understanding learning from the future as a specific kind of learning from experience. In this case it is **learning from pure experience** as a cognitive state where subjective and objective experiences converge along three levels of reflexive fields of awareness. Learning from the future and self-transcending knowledge can be theorized as specific kinds of learning and knowledge where a **three-fold integration of cognitive processes** is applied: integration of four modes of learning, integration of three levels of reflection, and integration of two time horizons – past and future – in the present moment of action. These seemingly contrasts and differences trigger a cognitive process of sense-making via relating which forms a creative act and enables action that transcends the individual's previous capacities to act by greater **coherence of thoughts** and greater **coherence of continuity and transformation**. Apart from the theoretical ideal, where cognition itself is transcended towards transconceptual perception and intuitive action, learning from the (emerging) future can come in various forms dependent on the degree of each of the three forms of integration.

6 Collective Knowledge, Learning and Cognition

Although organizations are collectivities made up of individuals, they do not seem to necessarily learn when their individual members learn: “When the knowledge held by individuals fails to enter into the stream of distinctively organizational thought and action, organizations know less than their member do. Conversely, there are situations in which an organization seems to know far more than its individual members.” (Argyris & Schön 1996, pp.6–7) So the question is whether, and if yes, how - under which conditions - thinking, knowing, or learning can be attributed to an organization or a collection of people. (Argyris & Schön 1996, p.5)

The notion of ‘collective knowledge’ has become the underlying concept of many studies in areas such as knowledge-based management, organizational learning and knowledge creation. However, there is still little clarity about the precise meaning of the term. (Hecker 2012, p.423) Within knowledge management, notions regarding the existence and nature of collective knowledge differ according to the views on the nature and sources of knowledge as such. There is **still no consensus** on the form of social or collective knowledge, not even on its existence.

Scientific work has mostly focused on individual concepts of knowledge leaving a **huge gap in work on features, qualities, structures and processes around collective knowledge**. Tsoukas and Vladimirou (2001) complain that the **links** between individual knowledge and organizational knowledge, questions on how knowledge becomes organizational, have remained relatively unexplored in the relevant literature. (Tsoukas & Vladimirou 2001, p.974) Erden (2008) highlights that within the comprehensive work on tacit knowledge - one of the key concepts in recent knowledge management – the focus has always been on individual tacit knowledge. Thus, features and qualities of group (tacit) knowledge still need to be identified and processes and reasons that enable a group of people to act as a ‘collective body’ need to be explained in detail. (Erden et al. 2008, p.5,6) Jakubik (2007) confirms that it is still unknown how individuals happen to act upon their knowledge as knowledge agents, so that individual knowledge becomes organizational or collective. (Jakubik 2007, p.9)

Hecker (2012) found that in most studies relying on the concept of collective knowledge, the notion is either not defined clearly or is used as a kind of umbrella term for a number of aspects like accumulation of knowledge, ways of distributing and sharing knowledge, collective memory or collective mind, a stock of knowledge, knowledge in a state of flow emerging from interaction, and others. Beyond these important aspects of collective knowledge, for Hecker the essential question is on the **relationship of collective knowledge, individual knowledge, and the individual knower**. (Hecker 2012, p.424)

Individualistic versus Social View

Individualistic, 'collectivist' approaches focus on the macro level which is assumed to be a result of aggregation of individual knowledge. They leave out micro-mechanisms, thus, do not provide an explanatory link from collective knowledge to the individual as a locus of knowledge and action. On the contrary, **social, 'constructionist' or 'connectionist'** approaches conclude that all knowledge is collective as knowledge is seen as irreducibly embedded in a form of collective practice. (Hecker 2012, p.425) In order to make nevertheless sense of the distinction between individual and collective forms of knowledge, Hecker assumes that both forms are mutually constituent without being the same. In order to answer the question of what it can mean for knowledge to be collective he proposes a **pluralistic epistemology** of collective knowledge. It integrates three different types of collective knowledge reflecting different meanings ascribed to it by different authors and in different contexts. (Hecker 2012, pp.425–426)

(1) Collective knowledge as **shared knowledge**

Collective knowledge is conceptualized as “knowledge shared by a group of individuals”, thus constituted by the **intersection of individual knowledge sets** including explicit or implicit knowledge. Sources of this concept of collective knowledge are common experiences and knowledge-sharing activities. Examples given are those of shared culture and shared communication. (Hecker 2012, p.427)

(2) Collective knowledge as **complementary knowledge**

Collective knowledge is conceptualized as “knowledge distributed among individuals interacting in a complementary way”. Individuals' specialized and disjunctive knowledge sets complement each other through **coordinated social practices** in such

a way that the collective group knows more than its individuals independently summed together. The '**surplus**' cannot be traced back to any single individual and forms the collective knowledge. Knowledge complementary is the underlying mechanism for generation of new knowledge and **emergence** of collective characteristics and phenomena. It unfolds on its own through **coordinated collaboration**. Collective phenomena are emergent in the sense, that they are on the one hand **dependent on the individual members but are not contained in or directly traceable to them**. (Hecker 2012, pp.427–429)

(3) Collective knowledge as knowledge embedded in **collective artefacts**

Collective knowledge is conceptualized as “knowledge incorporated in organizational artifacts rather than individual mindsets or action”. It is non-individual in the sense that it is externalized from individual knowledge and is constituted and maintained by ongoing processes of collective action and interaction. (Hecker 2012, p.429)

Within knowledge management, many approaches adopt an individualistic view based on the concept of collective knowledge as shared knowledge. Following Nonaka and Peltokorpi's review of top articles on knowledge management (2006), much of the knowledge management literature draws from economics and refers to the firm level, thus macro level, without having an explicit starting point from the individual level. They indeed stress the subjective, tacit, situational and dynamic dimensions of knowledge, but still treat it as an objective and functional entity rooted in regulation. (Nonaka & Peltokorpi 2006, p.77) These approaches consider knowledge to be intimately attached to the individual who holds it and collective knowledge is explained as a simple **aggregation** of individual knowledge. Cohen and Levinthal's concept of absorptive capacity (Cohen & Levinthal 1990) and Davenport's ideas on knowledge repositories and knowledge assets (Davenport et al. 1998) give an example. (Nonaka & Peltokorpi 2006, p.76)

On the other hand, there are scholars who propose that knowledge cannot be captured by taxonomies because of its fluid nature. (Nonaka & Peltokorpi 2006, p.76) This second, contrary view is adopted by approaches which take a **collective-level perspective**, be it constructivist or pluralist. These approaches consider knowledge as social constructs, which cannot be reduced to the meaning-giving activity of individual subjects. Thus, also collective knowledge is not reducible to individuals and represents a **distinct category, not just an**

aggregation. (Nonaka & Peltokorpi 2006, p.76) Nonaka’s knowledge-based management as introduced in chapter 2.2.2 – or as he later referred to it, organizational knowledge creation theory - and Tsoukas’ concept of distributed, complex knowledge (Tsoukas 1996; 2005b) are examples of this view. Their position on collective knowledge will be portrayed in chapter 6.1.

Collective Knowledge		
	Individualistic/Collectivist View	Social/Connectionist View
Epistemology		
- individual	cognitivist	constructionist/pluralist
- collective	shared knowledge	complementary knowledge
Principle	aggregation	emergence of distinct category
Mechanism	intersection of individual knowledge sets	coordinated interaction (social practice)
Authors	Cohen & Levinthal, Davenport	Nonaka, Tsoukas

Tab. 5.1: Dichotomic Ends of Conceptual Continuum for Collective Knowledge

Connectionist View as Promising Pathway

To make a decisive step in understanding collective or organizational knowledge, the macro level perspective need to be amplified and processes at the micro level, at the ground of human interaction need to be included. “As humans are frequently presented as aggregate parts of groups, there is a need for comprehensive conceptualizations of human nature and human interactions in social collectives as knowledge-creating beings.” (Nonaka & Peltokorpi 2006, p.77) This may be the reason why, in exploring the processes of collective knowing, Jakubik (2007) notices a shift in focus from static models proposing a simple aggregation of individual knowledge towards dynamic **connectionist models** where knowledge does not reside in each individual’s brain but in a system of interconnected people. Understanding knowledge as dynamic social construct, this emerging community or social view of knowledge opens up the ground for delivering insights into the functioning of knowledge in social entities and the unexplored phenomenon of collective knowing. (Jakubik 2007, p.16) **“To understand the generation and utilization of knowledge we need a theory of knowledge, and to understand organizational knowledge we need a theory of organization.”** (Tsoukas & Vladimirou 2001, p.975)

In search for a theoretical foundation for collective self-transcending knowledge we will follow this recommendation of Tsoukas and Vladimirou: We need a theoretical model for self-transcending knowledge, which was developed in chapter 5, and we need a theoretical model of organization, of interaction in collectives, of 'connectionism', which will be explored in the following chapters. Existing concepts of collective knowledge and cognition following a **social, connectionist view** will be reviewed within knowledge management (6.1) and organizational learning (6.2). Subsequently, latest concepts within cognitive science supporting a group mind thesis will be presented (6.3) and used as a platform for formulating a model that integrates recurrent and consistent aspects of knowledge management and organizational learning theories. As self-transcending knowledge has been qualified as a specific kind of tacit knowledge, the focus will be on theories of collective tacit knowledge.

Non-individual level tacit knowledge is studied under different names. Erden et al. (2008) list the attributes "group", "collective", "social", "communal" and "organizational" which are all found in literature on management and organization theory. Apart from minor differences, what they all have in common is that they refer to (tacit) knowledge "that is not possessed by one individual but created and possessed collectively by more than one individual" (Erden et al. 2008, p.6). Within this dissertation, the term 'collective knowledge' will be used to refer to this non-individual level knowledge encompassing various forms of collections of individuals. As knowledge was defined as a 'capacity to act' in chapter 3, collective knowledge is understood to describe a '**collective capacity to (collectively) act**'.

6.1 Concepts in Knowledge Management

Knowledge management approaches which especially emphasize the socially constructed nature of knowledge are Nonaka's Organizational Knowledge Creation Theory as described in chapter 2.2.2 and Tsoukas' theories of distributed and complex knowledge (Tsoukas 1996; 2005b). They argue that knowledge is created and held collectively through continuous social interaction. (Nonaka & Peltokorpi 2006, p.76) As Nonaka rather aims at explaining organizational creativity, change, and innovation more than at explaining how organizations conserve tacit knowledge through practices, he has not adequately accounted for the role of

social practices. (Nonaka & von Krogh 2009, p.644) Tsoukas, however, especially advanced the social practice view of organizational knowledge. In doing so, he stressed the particular importance of processes of organizing for collective knowing, and identified analogies from complexity theory as valuable for insights into collective processes of knowing. This chapter will first portray Nonaka’s and Tsoukas’ positions on collective knowledge before additional accounts using a complexity-based view on collective knowledge will be explored.

6.1.1 Group Tacit Knowledge in Organizational Knowledge Creation Theory

Trans-Subjectivity Through Synthesizing Dialogue and Practice

Within **Organizational Knowledge Creation Theory**, as developed by Nonaka et al., knowledge exists at **multiple levels**. In particular, Nonaka differentiates the four ontological levels of individual, group, organization, and inter-organization. The underlying idea is that the **organization takes the role** to explicate and integrate tacit knowledge at all of these organizational levels, thus forming the organizational knowledge spiral. Individual knowledge is crystallized and connected to the **organization’s knowledge system**. The knowledge creation process is understood as a process in which “individual knowledge is amplified and internalized as a part of an organization’s knowledge base and *vice versa*”. (Nonaka & Peltokorpi 2006, p.76; Nonaka et al. 2006, p.1179)

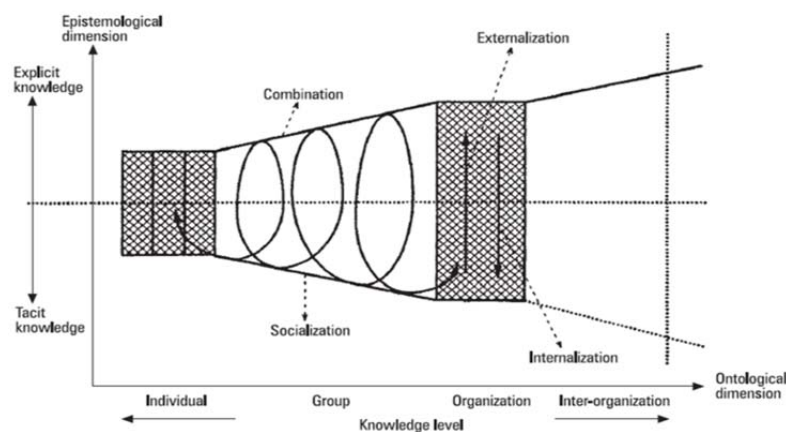


Fig. 6.1: Ontological Levels of the Knowledge Spiral (Nonaka & Takeuchi 1995, p.73)

“In a strict sense, knowledge is created only by individuals. An organization cannot create knowledge without individuals. The organization supports creative individuals or provides contexts for them to create knowledge. Organizational knowledge creation, therefore, should be understood as a process that ‘organizationally’ amplifies the knowledge created by individuals and crystallizes it as a part of the knowledge network of the organization. This process takes place within an expanding ‘**community of interaction**’, which crosses intra- and inter-organizational levels and boundaries”. (Nonaka & Takeuchi 1995, p.59)

The ‘community of interaction’ is conceptualized in more detail with the idea of ‘ba’, a multi-level shared context as described in chapter 2.2.3. The organization is understood as organic configuration of various ba, where people interact with each other and the environment. In ba, **trans-subjectivity** is achieved through participation in a process of dialectical thinking that displays three different roles in dialogue and practice: (Nonaka & Toyama 2003, pp.8–9)

- Innovator: senses the new reality first,
- Coach: interacts with first person, bringing in own viewpoint (inter-subjectivity),
- Activist: sees first and second person from higher viewpoint, making new reality understandable (trans-subjectivity).

Thus, **individual knowledge** is connected to the organizational knowledge system and becomes **organizational knowledge** through **synthesis**, i.e. **conversion** through various levels in the form of **social justification** and validation. (Nonaka et al. 2006, pp.1183–1184) Beliefs develop towards a truth when they can be justified, are useful to the group, enable the group to coordinate individual action, and shape ‘reality’. For Nonaka, justification and ‘reality’ is a process embedded in a social context. (Nonaka & von Krogh 2009, pp.639–640)

‘Knowledge outcome’ is an enhanced capacity to act which can be explicit (eg. product and process innovations) and/or tacit (eg. new social practice) along the continuum. (Nonaka & von Krogh 2009, p.646) In order to allow for strategic analysis of the knowledge system, beyond the strong focus on the process of knowledge creation, Nonaka introduced the concept of **knowledge assets** into his model. Knowledge assets represent accumulated products of past efforts and include routines, know how, concepts, patents, technologies, designs, brands or higher-order knowledge assets, i.e. creative routines like knowledge to create knowledge or to innovate and self-renew. (Nonaka et al. 2006, p.1194)

Yet, aggregation of knowledge assets does not represent the organizationally, collectively held knowledge base. Rather, the organization and its knowledge system, thus the collective knowledge base, are understood to be in a permanent state of becoming, in a permanent flux. So next to the knowledge assets, also present knowledge creating interactions as well as knowledge visions for the future are part of the knowledge system. “Knowledge assets represent an organization’s past, knowledge creation the present, and knowledge visions the future.” (Nonaka et al. 2006, p.1198)

So, if we want to seek collective knowledge, i.e. the collective capacity to act, in Nonaka’s organizational knowledge creation theory, we need to refer to the **sum of the present interaction of individuals which are given rise through experiences of past interaction and are guided through visions of the future.** “Although organizational knowledge creation theory suggests that the origin of all knowledge is individual, it also focuses on emerging groups for the purpose of knowledge creation [...] New tacit knowledge is socially constructed through interactions, not by an individual operating in isolation” (Erden et al. 2008, p.6)

To summarize, Nonaka’s position on the relationship between individual and collective level of knowledge can be described as follows: The individuals as cognizing human beings are the starting point for all knowledge creation. Yet, their interactions within the certain context, environment or organization of a given situation, synthesizes or converts individual knowledge into a trans-subjective level, which we can denote as collective knowledge. Hecker (2012) assigns Nonaka’s Organizational Knowledge Creation Theory within the concept of collective knowledge as shared knowledge. But, Nonaka’s strong focus on variety, dialectical thinking and self-transcending synthesis reflects also the complementary concept, thus placing his theory within the integrated framework of pluralist epistemology.

Interaction and Social Practice

Nonaka regards knowledge as “an ever-changing process of interaction in an ever-expanding field of relation” (Nonaka et al. 2008, p.2) Practitioners enter into existing and new practices where they socialize as they need to reflect on their rules of performance. Meeting other practitioners with various backgrounds (different knowledge, interests, social practices etc.)

allows them to gain new ideas and insights, to reflect on situations and to expand their boundaries. This way, social identity emerges cross social practices. (Nonaka & von Krogh 2009, p.645) Individual limitations are overcome by “intensifying interactions between organizational members who, thereby, can expand the boundaries of their knowledge [...] Interactions constitute the fabric of social practices”, thus “social practices may evolve around knowledge conversion” but there is limited understanding about how social practices emerge from knowledge conversion. (Nonaka & von Krogh 2009, p.646)

Nonaka admits that the “relationship between organizational knowledge creation theory and the social practice view of organizational knowledge is underdeveloped” (Nonaka & von Krogh 2009, p.646) and that “there are major research opportunities in exploring the intersection and relationship between social practices and organizational knowledge creation” (Nonaka & von Krogh 2009, p.647) “Organization science will benefit from a realistic discussion of when social practices enable or stifle organizational knowledge creation and vice versa”. (Nonaka & von Krogh 2009, p.647)

Obviously, when using the terminus ‘social practice’, Nonaka refers to two different meanings:

- On the one hand, he refers to a part of the background which an individual brings into an interactive situation, an ‘**individual social biography**’, representing an individual limitation, which can be transcended by interaction, as within interaction it is synthesized with others’ ‘social practice’. The idea that externalization and combination of knowledge is valuable hinges on differences in ‘social practices’. Understood this way, social practices are necessary, but not sufficient condition for organizational knowledge creation. (Nonaka & von Krogh 2009, p.646)
- On the other hand, he refers to social practices as something which **emerges from the knowledge conversion**.

Thus, **social practice has a dual meaning**. It refers to both, to an input as well to an output of interaction and knowledge creation. As an input it can represent the sum of individual social backgrounds (as outputs from past interactions), a form of **contextual input** which influences the specific way in which they interact together and forms a specific context or set of rules framing and structuring the interactive situation in ba. At the same time, new

forms of social practice emerge from interaction as an output, being shaped by new knowledge, viz. representing new knowledge through new capacities to act (figure 6.2).

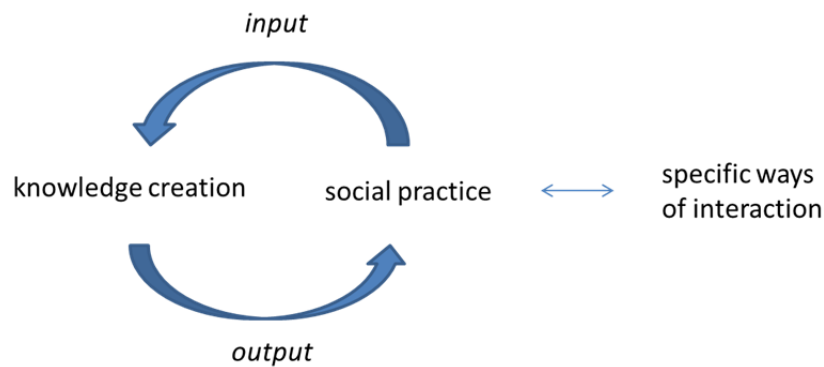


Fig. 6.2: Relationship Between Social Practice, Interaction and Knowledge Creation

When social practices are viewed as an input, the question is not if social practices are necessary or sufficient conditions for knowledge generation. Rather any social practice represents interaction, forms a 'ba' and therefore creates knowledge. So the question is which form of social practice and therefore interaction enables specific forms of knowledge. This idea is reflected within Erden, van Krogh and Nonaka's concept of group tacit knowledge which will be described in the following.

Group Tacit Knowledge

Erden, van Krogh and Nonaka (2008) clarified organizational knowledge creation theory's view on collective knowledge by developing the concept of "**group tacit knowledge**", which they define as "**the capacity of a group to act as a collective body using their collective mind in situations that are familiar as well as unfamiliar and complex in the absence of explicit rules or directions**". (Erden et al. 2008, p.9) When using the terminus 'group' they refer to its meaning as "a collection of people in a close relationship taking part in an interrelated activity with the aim of performing a task or achieving a common target" (Erden et al. 2008, p.7).

Group tacit knowledge has to do with coordination in complex activities. When through conversion tacit knowledge becomes collective for the group, "the group members begin to

act in a collective and coordinated manner, solving complex tasks, without explicit rules for action such as written procedures, decision rules, formal models, or even without explicit communication” (Erden et al. 2008, p.6). Thus, existing group tacit knowledge is considered as an **enabler for collective action** and the quality of group tacit knowledge influences the particular way of collective action. Social practice or ‘socialization’ is seen as the most critical step to create group tacit knowledge, but it are just seen as a necessary but not sufficient condition for *high* quality group tacit knowledge. The contribution of socialization to a group may vary and constitute various qualities of tacit knowledge for a group. (Erden et al. 2008, p.7)

Erden et al argue that collective tacit knowledge cannot be understood as the aggregation of all individual tacit knowledge but has a meaning in itself and that various levels of quality in group tacit knowledge are not a function of individual tacit knowledge but rather of the various contributions of socialization to a group. (Erden et al. 2008, p.5) This idea corresponds with the dual input/output view on social practices and with the question raised above: Which form of social practice enables certain specific forms of knowledge?

For group tacit knowledge, Erden et al. have identified six main characteristics:

- (1) **Social Creation.** Group tacit knowledge is a result of social interaction in form of socialization: members of a group understand each other’s definition of shared situations, agree on a common definition and come to hold justified true belief about how to act in that situation. (Erden et al. 2008, p.7)
- (2) **Rootedness in action.** The relation between collective action and group tacit knowledge can be compared to a **growing loop**: Group tacit knowledge is achieved by collective action and used to act collectively. Members of a group need to build a **collective mind** as formulated by Weick and Roberts (chapter 6.3.1) in order to be capable to act as a collective body. (Erden et al. 2008, p.7)
- (3) **Dependence on requisite variety.** Dynamic coordination and mindful interrelating integrates the various capabilities and specific strengths and weaknesses of individual members so that group tacit knowledge is **more than the sum** of individual tacit knowledge. (Erden et al. 2008, p.8)
- (4) **Rootedness in commitment, values, senses and emotions.** The capacity to act collectively as a group requires collective sense making mechanisms. Shared events

need to be converted into shared experience by attention to the same stimuli and sharing of a common goal orientation. (Erden et al. 2008, p.8)

(5) **Capability of a group to agree on the best action for “common goodness”.** In order to be able to act collectively, a group should follow the principles of ‘phronesis’ and determine and undertake best action for ‘common goodness’ in a specific situation, that is, the group should define what is ‘good’ for the group. (Erden et al. 2008, p.9) ‘Good’ in this context is socially constructed as a result of a compromise between individual perspectives. (Erden et al. 2008, p.12)

(6) **Group tacit knowledge allows the group to deal with uncertainty.** Group tacit knowledge tackles the complex problem of ‘multiple contingency’, i.e. that members have uncertainty on how the other members may act. It provides a group with the “ability to ‘guess’ what the others may act like in different situations” so that the group is capable to cooperate and act spontaneously even in uncertain and unfamiliar situations. (Erden et al. 2008, p.9)

Various quality levels of group tacit knowledge have various direct impact on the coordination and performance of the group’s collective action. Vice versa, group tacit knowledge is created by the inherent collective action of a group. Erden et al. propose a model of four different quality levels of group tacit knowledge as depicted in figure 6.3. They range from modest to highest quality: group as assemblages, collective action, phronesis and collective improvisation. (Erden et al. 2008, p.10)

At level 1, group as **assemblages**, one cannot speak of real group tacit knowledge. The group is not more than a ‘collection of people’ with weak group ties and identities, without shared memory, understanding or norms. (Erden et al. 2008, p.10)

At level 2, **collective action**, the group shares memories and understanding through exposure to shared events, has embedded routines and patterns of behavior as well as a group culture or collective identity. As members understand the nature and value of ‘collectively acting’ the group becomes a **collective body and mind** which can act collectively in certain familiar situations. (Erden et al. 2008, p.11)

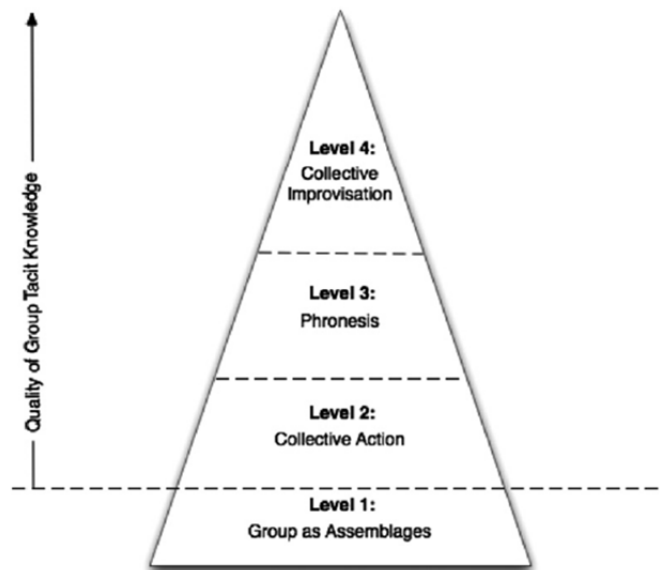


Fig. 6.3: Levels in the Quality of Group Tacit Knowledge (Erden et al. 2008, p.10)

At level 3, **phronesis**, collective practical experiences enable the group to (1) collectively grasp the essence of particular situations with the help of common sense, (2) to decide heedfully, and (3) to take appropriate actions for these situations guided by socially constructed common goodness (group values, group culture, shared goals). The group can (4) find ways to “exploit the individual differences and strive for a negotiated result”, thus converting “I-intention” to “**we-intention**”, a special kind of intention underlying joint action or joint seeing that a certain event comes about. A ‘one for all, all for one’ understanding emerges. (Erden et al. 2008, pp.12–13)

At level 4, **collective improvisation**, the group is able to **make sense** and to react quickly and appropriately in complex, unpredictable situations through spontaneity and intuition. The group builds on a collective mind which leads “not only to coordination in certain situations but also to **collective intuition**”. Each member intuitively acts in a way that is consistent with the actions of others through full concentration and attention to others’ actions over time. Outcome may range from incremental change of routines to radical creativity. (Erden et al. 2008, p.13)

Which level of quality is required for a certain task depends on the task specifications. (Erden et al. 2008, p.14) Knowledge creation, innovation and creativity require high level group tacit knowledge and it is a leadership task to create conditions that provide groups with such

knowledge, to create the context or ba necessary for collective action, while finding ways to enhance the quality of tacit knowledge on all levels. (Erden et al. 2008, p.15)

6.1.2 Organizational Knowledge in Distributed Knowledge Systems

Distributed Knowledge Systems

Tsoukas' ideas on distributed knowledge systems are assigned to the 'social practice view' of organizational knowledge which holds that tacit knowledge is acquired through participation in social practices that are constituted of a complex web of people, artifacts, and activities. (Nonaka & von Krogh 2009, p.644) For Tsoukas, utilization of knowledge which is not, and cannot be, known in its totality by a single mind or agent is an issue of organization. (Tsoukas 1996, p.11,22) He describes firms as distributed knowledge systems where the attribute 'distributed' applies in three senses: (Tsoukas 1996, p.22)

- in a **computational** sense that the factual knowledge of the particular circumstances of time and place cannot be surveyed as a whole.
- in the sense that knowledge is inherently **indeterminate**: facing uncertainty firms cannot know what they need to know in advance. They lack the cognitive equivalent of a 'control room' or 'overseeing mind', thus are not only distributed, but decentered systems.
- in the sense that knowledge is partly derived from the context within which a firm is embedded and is continually (re)constituted through the activities undertaken within a firm. Thus, a firm's knowledge is **emergent**: it is not possessed by a single agent, it partly originates 'outside' the firm, and it is never complete at any point.

A firm's knowledge, at any point of time, is seen to be the indeterminate outcome of individuals attempting to manage the tensions between their stocks of knowledge. (Tsoukas 1996, p.11) Individuals' stock of knowledge contains normative expectations, dispositions formed by past socializations and interactive situations. How these elements are then matched is always a contingent, emergent, indeterminate event. "From a research point of view, what needs to be explained is [...] how [...] in a distributed knowledge system coherent action emerges over time." (Tsoukas 1996, p.22)

All Knowledge is Personal and Collective

In their fundamental work on “What is Organizational Knowledge?”, Tsoukas and Vladimirou (2001) conceptualize organizational knowledge by fusing Polanyi’s insight that all knowledge is personal with Wittgenstein’s insight that all knowledge is, in a fundamental way, collective. They stress that both philosophers showed that even the most abstract formalism we use ultimately depend on social definitions. Abstract systems are necessarily grounded on collective definitions and depend on human judgment. However, for Polanyi, this judgment is equally manifested at the individual level, that is why all knowledge is personal knowledge, or all knowledge contains a personal element, or – citing Polanyi – ‘personal **participation** is the universal principle of knowing’. (Tsoukas & Vladimirou 2001, p.981) Engaging deeply with Polanyi’s work, Tsoukas and Vladimirou stress that “All knowledge has its tacit presuppositions, thus tacit knowledge is not something that can be converted into explicit knowledge.” (Tsoukas & Vladimirou 2001, p.975)

As already portrayed in chapter 3.1.2, individual knowing is acting in the sense that the individual acts to integrate a set of particulars of which he or she is subsidiarily aware. Individuals comprehend something as a whole focally by tacitly integrating certain particulars, which are known by him or her subsidiarily. Knowing has a ‘from-to structure’: the particulars impact on the focus *to* which I attend *from* them. Thus, knowing always has three elements: subsidiary particulars, a focal target, and a person who links the two. (Tsoukas 2000, p.107)

Tsoukas applies this view of knowledge-as-action to the collective level: Stories and artifacts that practitioners share constitute a certain type of ‘heuristic knowledge’ that has been historically generated in response to remarkable events. Individual practitioners subsidiarily draw on such collective knowledge while tackling a particular problem. They are focally aware of a problem by tacitly integrating the knowledge subsidiaries with the focal problem. (Tsoukas 2000, pp.107–108) For knowledge to be effectively applied, it needs to be instrumentalized - to be used as a tool. As we learn to use a tool, we gradually become unaware of how we use it. Polanyi called this ‘indwelling’ – dwelling in the tool, making it feel as if it is an extension of our own body. We make sense of experience by assimilating the tool through which we make sense. The lapse into unawareness of the manner in which we

use a tool is accompanied by an expansion of awareness of the experiences at hand, on the operational plane. (Tsoukas & Vladimirou 2001, p.983)

Distinctions Based on Contextuality and Organization

For Tsoukas, knowledge is the **capacity to exercise judgment and action**. It is the outcome of knowing as a process which - following Maturana and Varela (1987) – is understood as a process of someone drawing distinctions. **Distinctions** - the split into “this” and “that” – bring into consciousness the constituent parts of the phenomenon we are interested in. Through language we constantly bring forth and ascribe significance to certain aspects of the world, including our own behavior. The more refined our language, the finer our distinctions. (Tsoukas & Vladimirou 2001, p.977) Drawing on constructivism (see chapter 3.1.1), for Tsoukas, cognitive processes are **never-ending processes of computing descriptions of descriptions**, processes of recursively transforming and modifying representations. In doing so, individuals rearrange and reorder what they know, thus creating new distinctions and, therefore new knowledge. (Tsoukas & Vladimirou 2001, p.978)

New knowledge, thus the changed capacity to exercise judgment and action, involves two things: the **self-conscious desire to see things differently** and disclose new aspects in order to be able to draw distinctions and the fact that the individual is currently located at a **certain standpoint or tradition**. He is located within a collectively generated ‘domain of action’ in which particular criteria of evaluation hold, a “language-mediated domain of sustained interactions”. Knowing how to act within a domain of action is learning to make competent use of the categories and the distinctions constituting that domain. (Tsoukas & Vladimirou 2001, pp.977–978)

“Knowledge is the individual ability to draw distinctions within a collective domain of actions, based on an appreciation of context or theory, or both” (Tsoukas & Vladimirou 2001, p.979), in which appreciation of

- **context** refers to the idea that an individual is capable to act within a particular context as a result of having been through processes of socialization. To situations of interaction, we bring a tacit awareness of relevant expectations and an intuitive appreciation of consequences of rule-breaking.

- **theory** refers to appreciation of any framework or set of abstract principles that enable an individual to generalize across contexts.

So when does knowledge become organizational? “In a weak sense, knowledge is organizational simply by its being generated, developed and transmitted by individuals within organizations. [...] In a strong sense, however, knowledge becomes organizational when, as well as drawing distinctions in the course of their work by taking into account the contextuality of their actions, individuals draw and **act upon a corpus of generalizations in the form of generic rules produced by the organization.**”(Tsoukas & Vladimirou 2001, p.979) Obviously, Tsoukas has split Nonaka’s ‘social practice’ and its dual meaning into two termini. With ‘context’, Tsoukas refers to the meaning of social practice and socialization as initially used by Nonaka, which is the ‘individual social biography’ an individual brings to a situation of interaction, while ‘theory’ or ‘generic rules’ refers to the rules structuring or organizing this situation of interaction.

An **organized activity** provides actors with a given **set of cognitive categories and rules of action**. “Rules are prescriptive, propositional statements guiding behavior in organization, thus an **organization may be seen as a theory** – a particular set of concepts or cognitive categories.” (Tsoukas 2000, p.108) They have once been put in place for some certain higher-order reasons and preferences, which may fade during time so that rules may recede into the background of activities. (Tsoukas 2000, p.109) Thus, rules or propositional statements are put into action by organizational members who are **collectively able to sustain a shared sense of what rules imply**. The justification or purpose underlying a rule needs to be elaborated and their meaning agreed by the organizational collective. Tsoukas suggests the notion of the **organization as a “densely connected network of communications through which shared understandings are achieved”**. (Tsoukas 2000, p.110) Organizational knowledge is identified with cultural or collective knowledge – “a distinctive way of thinking and acting in the world”. (Tsoukas & Vladimirou 2001, p.981)

What makes knowledge distinctively organizational is its codification in the form of propositional statements underlain by a set of **collective understanding**. Given that individuals put organizational knowledge into action within particular contexts, there is always **room for individual judgment and for the emergence of novelty**. (Tsoukas & Vladimirou 2001, p.989) Individuals comprehend the general by relating it to the particular

they are confronted with. Thus, every act of interpretation is necessarily creative and heuristic knowledge is a necessary outcome of the interpretative act. This dialectic between the general and the particular gives organizational knowledge its dynamism. Without the general no action is possible. And without the particular no action may be effective. (Tsoukas & Vladimirou 2001, p.989)

“Organizational knowledge is the capability members of an organization have developed to *draw distinctions* in the process of carrying out their work, in particular *concrete contexts*, by enacting sets of generalizations (*propositional statements*) whose application depends on historically evolved *collective understandings* and experience.” (Tsoukas & Vladimirou 2001, p.983)

When organizational knowledge is understood in this way, managing organizational knowledge means to turn unreflective practices into reflective practices. A practice may be (unreflectively) mastered but practical mastery need to be supplemented by an understanding of what individuals are doing when they exercise that mastery. Knowledge management then is the process of elucidating the rules guiding the activities of the practice. It implies the sensitive management of social relations and social practices. (Tsoukas & Vladimirou 2001, pp.990–991) **New knowledge** is created when skilled, practical performance is newly shaped by **social interaction**. (Tsoukas 2005c, pp.158–159)

6.1.3 Complexity-based Approaches to Organizational Knowledge

The importance of tacit knowledge and knowing for organizational knowledge management and their high levels of interdependency introduced complexity to the topic of interest. “Organizations are increasingly realizing that there is a body of tacit knowledge that cannot be made explicit, and that even much of what can be made explicit shouldn’t be, on grounds of either cost or flexibility [...] much knowledge is held collectively within communities, and cannot be represented as the aggregation of individual knowledge”. (Snowden 2000, pp.52–53) The organization is recognized as a “complex network of tribes” and space is opened up for a new organic – instead of mechanical - metaphor of management theory informed by complexity theory. (Snowden 2000, pp.52–53)

Snowden sees a new pattern of knowledge management practice emerging, in which the organization is treated as a complex ecology. (Snowden 2000, p.54) “Complexity-based thinking, whether through direct action or metaphor, is a fundamental shift in the way we think about organizations. It is not the latest in a set of fads or concepts that extend and develop the Taylorist philosophy. Instead, it bounds Taylorism, limiting it to the execution of stable and structured initiatives, just as Newtonian science was bounded but not invalidated by the discoveries of modern physics.” (Snowden 2000, p.62)

While the use of mechanical metaphors tries to derive recipe books from best practice, an organic, complex metaphor aims at identifying underlying principles or concepts that result in practice. “The practices themselves cannot be generalized into universal models, as they result from the application of the principle but are not principles in themselves. In a complex world, *best* practice is too context specific for universal application; it is always *past* practice.” (Snowden 2000, p.55) To inform the organic metaphor for organization by complexity means to shift the awareness from following generalized practice to applying basic concepts. Underlying principles remain the same but each solution will be unique. Knowledge management then resembles rather an “**intervention-based journey open to discovery**, rather than determining goals focused entirely on exploitation of what is currently known. [...] This is likely to be **bottom up, rather than top down**.” (Snowden 2000, p.55) “In dealing with a complex system, we need to **draw boundaries and construct interventions that result in complex activity**.” (Snowden 2000, p.63)

Knowledge as Active Process of Relating (Stacey)

Interpreting **analogies from the complexity sciences** in a particular way as the basis for a perspective on knowledge creation in organizations, Stacey argues that knowledge is continuously reproduced and potentially transformed in processes of interaction between people and can be understood as an active, ephemeral “**complex responsive process of relating**” (Stacey 2000, p.23) This notion includes that knowledge cannot be shared nor can it be possessed as relationships cannot be shared or owned, but actions of relating **can only be performed**. Stacey follows the notion on enabling of knowledge as stated in chapter 3.1.4: “The conclusion is that while it is possible to nurture knowledge, it is impossible to “manage” it, when “manage” is understood in its conventional sense.” (Stacey 2000, p.23)

Stacey criticizes mainstream thinking in organizational learning and knowledge creation for its division of individual and the collective - such as the group, the organization, and society - into two distinct phenomenal levels where interaction of individuals create a level above that of the individual, which then constitutes the context influencing how individuals interact. (Stacey 2000, p.24) Dialogue is meant to happen within relations in form of culture or social structure, forming another social context at the higher level resulting in a **circular, systemic interaction between the two levels**. (Stacey 2000, p.25)

From Stacey's complex responsive process perspective, knowledge is always a process of responsive relating, which cannot be located simply in an individual head, then to be extracted and shared as an organizational asset. From his perspective, knowledge "is the act of conversing and **new knowledge is created when ways of talking, and therefore patterns of relationship, change**. [...] The knowledge assets of an organization then lie in the pattern of relationships between its members and are destroyed when those relational patterns are destroyed. Knowledge is, therefore, the **thematic patterns organizing the experience of being together**. It is meaningless to ask how tacit knowledge is transformed into explicit knowledge, since unconscious and conscious themes organizing experience are inseparable aspects of the same process. Organizational change, learning, and knowledge creation are the same as change in **communicative interaction**, whether people are conscious of it or not. This perspective suggests that the **conversational life** of people in an organization is of primary importance in the creation of knowledge." (Stacey 2000, p.37)

Stacey uses complexity theory and the modeling of complex adaptive systems as a source for analogies with human action, but at the same time advises for **high caution** in doing so: Seeing human interaction as a system leads to infinite regress as there is no analogy in human action for the external system designer or observer and the very act of observing others' interaction is itself an interaction. So the analogy is not the system, but the process of interaction in systems' simulation. (Stacey 2000, p.26) A

Modeling of complex adaptive systems demonstrates the possibility that "processes of interaction in local situations have the intrinsic capacity for patterning themselves as continuity and transformation at the same time", in the absence of any blueprint or external designer. (Stacey 2000, p.27) In analogy, Stacey suggests that "**human relating intrinsically patterns living human experience as the coherence of continuity and transformation**. This

coherence is meaning, that is, knowledge emerging in the living present in local interactions without any global blueprint, plan, or vision.” (Stacey 2000, p.27)

Stacey refers to computer simulations where local interaction between symbol patterns “organizes the pattern of interaction itself, since there is no set of instructions organizing the global pattern of interaction” (Stacey 2000, p.28). They “demonstrate the possibility of digital symbols self-organizing, that is, interacting locally in the absence of a global blueprint, in the dynamics at the edge of chaos to produce emergent attractors of a novel kind, provided that the symbol patterns are **richly connected and diverse enough.**” (Stacey 2000, p.29) This interaction between patterns of digital symbols can provide an abstract analogy for human interaction, if **social interaction** is understood as a “highly sophisticated process of cooperative interaction between people in the medium of symbols in order to take joint action” (Stacey 2000, p.34) Interaction is seen as a “**rudimentary form of social behavior**” and **knowing and knowledge as “properties of interaction, or relationship**” (Stacey 2000, p.30). “Meaning does not first arise in an individual and is then expressed in action, nor is it transmitted from one individual to another. Rather, meaning emerges in the interaction between them. Meaning is not attached to an object, or stored, but repeatedly created in the interaction.” (Stacey 2000, p.30)

Stacey explains ‘mind’ as a process of conversational interaction from which meaning and knowledge emerges and which can take a social attitude dependent on quantity and quality of interaction: “As soon as one can take the attitude of the other, that is, as soon as one can communicate in significant symbols, there is at least a rudimentary form of consciousness. [...] The nature of the social has shifted from mindless cooperation to mindful, role-playing interaction, made more and more sophisticated by the use of language. Meaning is now particularly constituted in **gesturing and responding in the medium of vocal symbols**, that is, conversation. Mind, or consciousness, is the gesturing and responding action of a body directed toward itself as private role-play and silent conversation, and **society is the gesturing and responding actions of bodies directed toward each other.** Conversational relating between people is the process in which meaning, that is, knowledge, perpetually emerges.” (Stacey 2000, p.33) “As more and more interactions are experienced with others, so, increasingly, more roles and wider ranges of responses enter into the role-playing activity that is continuously intertwined with public gesturing and responding. [...] Eventually,

individuals develop the capacity to take the attitude of the whole group, that is, the social attitude, as they gesture and respond. The result is much more sophisticated processes of cooperative interaction.” (Stacey 2000, p.33)

The responding actions of the individual are both being called forth by the other and being enacted, or selected by its individual, biological and social history. This constructivist dimension points to the importance of difference, or **diversity**, in the emergence of the new, in the potential for transformation. (Stacey 2000, p.34) “As with interaction between bodies, the social, so with interaction of a body with itself, the mind, there is the experience of both familiar **repetition of habit and the potential of spontaneous change**. The process is not representing or storing, but continuously reproducing and creating new meaningful experience. In this way, the fundamental importance of the individual self and identity is retained, along with the fundamental importance of the social. In this way, too, both continuity and potential transformation are always simultaneously present. Furthermore, there is no question of individuals at one level and the social at another. They are **both at the same ontological level.**” (Stacey 2000, p.35)

Within Stacey’s perspective, the individual is an interactive process conducted with itself, and the group, organization or society are interactive processes between different bodies with both processes being conducted in the same medium of symbols. Thus, according to Stacey, the relationship between individual and collective level is not really a relationship but the individual and the collective simply refer to two degrees of detail in which the whole process is being examined. They are “**fractal processes**” belonging to the same kind of phenomena, at the same ontological level. (Stacey 2000, p.36)

In this view, even **culture and social structure** - values, beliefs, traditions and habits - are explained as a certain couplings of gesture and response, albeit of a predictable, highly repetitive kind. They are not ‘stored and shared’ but continually reproduced in the interaction between people. As no single habit or context of interaction exactly stays the same over time, also culture may vary and change over time due to some spontaneous variation in the repetitive reproduction of patterns called habits. (Stacey 2000, p.36)

Recorded and written artifacts are “simply records that can only become knowledge when people use them as tools in their processes of gesturing and responding to each other. What is captured in these artifacts is inevitably something about the meanings of social acts

already performed. Since a social act is ephemeral and since knowledge is social acts, it can never be stored or captured. Habits here are understood not as shared mental models but as history-based, repetitive actions, both private and public, reproduced in the living present with relatively little variation.” (Stacey 2000, p.37)

To summarize, by drawing on analogy from complex adaptive systems simulation, Stacey suggests that patterns of relating in local situations can produce emergent global patterns in the absence of any global blueprint. The circular process of gesturing and responding between people who are different to one another can be thought of as self-organizing relating in the medium of symbols having intrinsic patterning capacity. These emergent patterns can constitute both continuity and novelty, both identity and difference, at the same time. This complex responsive process of relating amounts to a particular **“causal framework, where the process is one of perpetual construction of the future as both continuity and potential transformation at the same time.** Individual mind and social relating are patterning processes in bodily communicative interaction, forming and being formed by themselves.” (Stacey 2000, p.36) Knowledge is the sum of the properties of such interaction and relating.

6.2 Concepts in Organizational Learning

The idea of organizational learning has already been around for several decades when the idea of knowledge management emerged in the mid of the 90ies. While the former was dominated by scholars with a human resource orientation, knowledge management was led by technologists and economists. However, Easterby-Smith et al. recognize signs of convergence between these two academic communities as they share similar underlying concepts and problems, even though they might use different terminology. The point of convergence lies in the combination of social aspects of organizational learning with the more technological views of knowledge management. (Easterby-Smith et al. 2000, pp.787–788) A debate about the sociology of knowing and learning might help to establish a theory accounting for the many related concepts, such as organizational learning, knowledge management, sense-making, organizational change and dynamic capabilities. (Crossan et al. 2011, p.453)

So far, no well accepted theory of organizational learning has been established. (Crossan et al. 2011, p.451) Yet, within the debate on organizational learning there is broad acceptance of multiple levels of learning. The traditional idea that learning takes place within individual heads has been broadened to a **social constructionist perspective** which assumes that learning occurs through conversations and interactions between people. Learners are now seen as “social beings which construct their understanding and learn from social interaction within specific socio-cultural and material settings” which produced a “shift from an ‘epistemology of possession’ to one of ‘practice’ ”. Knowledge is always enacted and situated, and learning is seen as the “process of becoming a competent participant in a social and organizational process”. (Easterby-Smith et al. 2000, pp.787–788) Also adopting the participation metaphor, Elkjaer defines a ‘third way’ of organizational learning as the development of knowledge “by inquiry (or reflective thinking) in social worlds held together by commitment” and gives intuition and emotion a key role. (Elkjaer 2004, p.419)

6.2.1 The 4I Organizational Learning Framework

One of the most cited approaches of organizational learning is the multilevel, dynamic ‘4I framework’ by Crossan et al. (1999) which proposes a “situated nature of OL in which the individual and context are intimately intertwined” (Crossan et al. 2011, p.454). Learning arises as an ongoing tension between assimilating new learning (exploration) and using what has already been learned (exploitation). This tension and its resolution occur at and transgress all organizational levels which are linked by four social and psychological processes: intuiting, interpreting, integrating, and institutionalizing (the 4I’s). Learning flows across these levels through the 4I processes in the form of feedback and feed-forward linkages. (Dutta & Crossan 2005, p.433)

Learning begins with individuals who make sense of actual experience. When shared within various levels of the organization a shared understanding develops (feed-forward learning, exploration). Yet, learning is also transferred from the organization to individuals and groups by organizational structure or guidance (feedback learning, exploitation). (Dutta & Crossan 2005, pp.434–435)

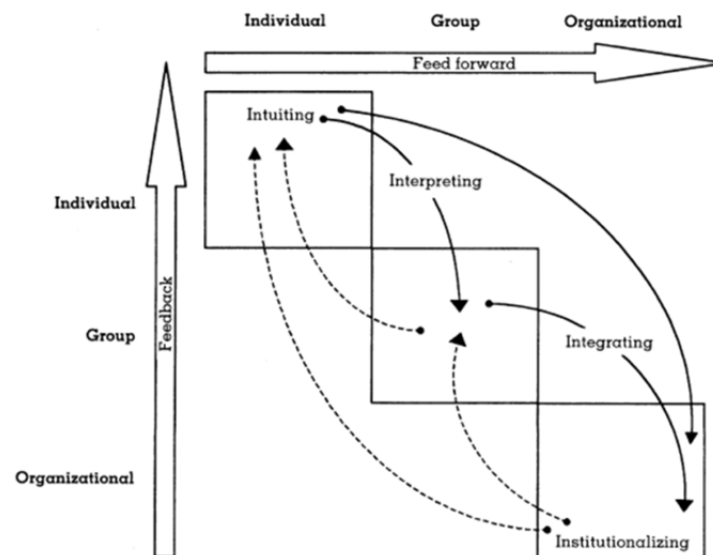


Fig. 6.4: Organizational Learning as Multi-level Dynamic Process (Crossan et al. 1999, p.532)

Thus, assuming interconnectivity between levels of learning, the 4I framework proposes that learning resides within and across levels which are linked through activities. (Crossan et al. 2011, p.454) Crossan et al. argue that, while it is important to develop ‘within-level’ understanding, it may be **dangerous to isolate levels**. Instead, it is required to understand how the levels relate, to ‘think macro *and* micro’. (Crossan et al. 2011, pp.449–450) This is supported by others authors such as Elkjaer, who understands **learning as participation in social processes**. She proposes to “bring the relation between individuals and organizations to the fore” in organizational learning and who understands this relation as “a transaction, a continuous and mutual formation of both” (Elkjaer 2004, p.429). Crossan et al. propose that the 4I processes are often connected in a complex and nonlinear way. A deeper insight into the processes might be helpful in exploring enablers and barriers of learning, as well as different qualities and types of learning. (Crossan et al. 2011, p.450)

During the transition from individual to group to organization, the **cognition/behavior** dichotomy breaks down. (Crossan et al. 2011, p.450) There is an “interactive relationship between cognition and action [...] Understanding guides action, but action also informs understanding” (Crossan et al. 1999, p.524). Referred to the context of business opportunities, this assumes that opportunities are rather enacted than discovered (Dutta & Crossan 2005, p.435).

For a move towards a theory for organizational learning, Crossan et al. see strong potential in drawing from **multilevel and evolutionary perspectives as proposed by Weick** (2005), for example. (Crossan et al. 2011, p.456) They propose that organizational learning is a phenomenon that fits a **homologous model** featuring parallel constructs at each level of analysis and homologous linking processes to connect the individual, group and organizational levels through the 4I's. The type of emergence of organizational learning is assumed to be a "bottom-up and interactive process (feedforward). Yet the emerged phenomenon at one level dynamically affects constructs and processes at lower levels of analysis (feedback). **Bottom-up and top-down** processes are dynamically related so that lower-level emergence is generally constrained by higher-level forces. The emergence of OL begins at the individual level of analysis with cognition, affect, and behavior as key elements of the individual's intuiting" (Crossan et al. 2011, p.457) Cognition, affect and behavior form the 'elemental content' or the 'raw material' of emergence, which are combined at the group level during interpreting and integrating. The emergence at the group level culminates in emergence at the organization level through further interaction." (Crossan et al. 2011, p.457) In other words, organizational learning emerges through processes where dissimilar elemental content of heterogeneous individuals interact in irregular, nonlinear, unpredictable ways. (Crossan et al. 2011, p.457)

6.2.2 Collective Sense-making by Organizing

Argyris and Schön understand organizational learning as a metaphor whose spelling out requires to reexamine the idea of organization. "In order to explore organizational learning we must rethink what we mean by organization". (Argyris & Schön 1978, p.28; Argyris & Schön 1996, p.6) Some collections of individuals are organizations and others are not. And one that is an organization, does not act as organization whenever one of its members acts, for example when it sleeps or talks privately to friends. Thus, organizational action is both different from and conceptually connected to individual action. (Argyris & Schön 1978, p.12)

A collectivity becomes an organization capable of acting by establishing rule-governed ways of deciding, delegating, and setting boundaries of membership. Members of the collectivity begin to become a recognizable 'we' that can make decisions and translate their decisions into actions when (Argyris & Schön 1996, pp.8–9)

- procedures for making decisions in the name of the collectivity have been agreed upon,
- authority to act for the collectivity has been delegated to individuals,
- boundaries between the collectivity and the rest of the world have been set.

If a collectivity meet the conditions, so that its members can act for it, then it may be said to learn when its members learn for it, carrying out on its behalf a process of inquiry that results in a learning product. (Argyris & Schön 1996, p.11) It is individuals who decide and act, but they do these things on behalf of the collectivity, as its agents by virtue of the rules for decision, delegation, and membership. When the members of the collectivity have created such 'constitutional' rules [...], they have organized. (Argyris & Schön 1996, p.9)

The basic definition of the conditions for organizational action comprises various kinds of task systems: ephemeral organizations - temporary, informal organizations which may arise spontaneously in response to a crisis – or agencies such as collections of people that makes decisions, delegates authority for action, and monitors membership, all on a continuing basis or collective vehicles for the regular performance of tasks (eg households, folk societies, firms, churches, schools, etc.), tightly or loosely coupled, rigid or variable. (Argyris & Schön 1996, pp.9–11)

“Each member of an organization constructs his own representation of the theory-in-use of the whole, but his picture is always incomplete. He strives continually to complete his picture by re-describing himself in relation to others in the organization. As conditions change he remakes his descriptions; other individuals do likewise. There is a continual, more or less **concerted meshing of individuals' images** of their activity in the context of their collective interaction. [...] An organization is like an organism, each of whose cells contains a particular, partial, changing image of itself in relation to the whole.” (Argyris & Schön 1996, pp.15–16) For Argyris and Schön, organizational learning has to do with active processes of organizing, as proposed by Weick (2005), where the members' evolving images of the organization shape the very object of their investigation. (Argyris & Schön 1996, p.16) Similarly, Clegg et al. (2005) link learning to processes of organizing and becoming. Learning is considered as being constituted in the interplay between order and chaos, as the driving force beyond organization (Clegg et al. 2005, p.162)

Organization – Input and Output of Complex Interaction

According to Tsoukas there is a **lack of theories of creative action in organizations** and more work is needed on how structure interacts with process over time, how reflexivity functions, and how context and contingencies influence action paths. Tsoukas proposes that organization theory should be concerned with the study of patterned interaction and embrace the image of organizations as '**chaosmos**' which holds two features: that of a cosmos - a pattern - and that of chaos - a gaping void from which new patterns, a new cosmos arises. As human imagination and interaction give rise to new forms and enable new practices to emerge, organizations do not have a fixed identity over time and space but are "constitutively social all the way – discursive practices embedded within discursive practices". (Tsoukas 2005d, pp.389–390)

For Tsoukas, the analogy between organizations and chaotic systems is not to make a factual statement but rather to imagine organizations as if they were chaotic systems and see what might be the consequences of this. Analogies are not discovered but constructed and a metaphor causes us to shift attention to unsuspected features of an object of study. It does not acquire meaning before it begins to resonate with other people's experiences. Thus, **chaos and complexity metaphors** draw our attention to certain features of organizations hitherto only subliminally aware. "Notions like 'non-linearity', 'sensitivity to initial conditions', 'iteration', 'feedback loops', 'novelty', 'unpredictability', 'process', and 'emergence' make up a new vocabulary in terms of which we may attempt to redescribe organization." (Tsoukas 2005a, pp.223–224)

Organization theory has widely neglected the process through which apparently 'solid' structures are constructed, maintained, and modified in the course of interaction. An exemption is Weick (Weick 2001; Weick et al. 2005) who shifted the attention from organizations to organizing by showing that **structure emerges in the mind**, in the gradual reduction of equivocality surrounding human interaction. It shifted the classical **structure versus process debate** to the examination of **processes through which structure is generated**. However, the **question how structure and process interact** is still hardly tackled. (Tsoukas 2005d, pp.379–380)

While formal organization is an input into human action, **organization at large is an outcome of it** which Tsoukas describes as “a **pattern emerging from actors adapting to local contingencies and closely interrelating their actions with those of others**”. (Tsoukas 2005d, p.381) For an expanded understanding of organization the focus need to be shifted to patterns of coordination between actors and include self-organization – understood as immanently generated order. **Organization is a self-generating pattern, “a ‘spontaneous order’** – a collectively generated outcome as actors improvise to accommodate local contingencies and interweave their actions across space and time”. (Tsoukas 2005d, p.381) In order to **understand the dynamic processes through which organization emerges** Tsoukas proposes to focus on organization as such, not on formal organizations. “New patterns of social organization suggest that it is possible for actors to be organized outside the bounds of ‘imperative co-ordination’ and authoritative coordination is only one way through which patterned interaction may be achieved.” (Tsoukas 2005d, pp.380–381)

Weick conceives of organizing as a set of processes for reducing equivocality among actors. Organizing consists of reducing differences among actors and providing them with a set of cognitive categories and a typology of actions. (Tsoukas & Chia 2005, p.191) Organizations are in permanent change - and change is always organizational as it is channeled, guided, and led by organizing. **Organization has a double meaning here:** organizations are sites of continuously changing human action; and organization is the making of form, the patterned unfolding of human action. **Organization in the form of institutionalized categories is an input into human action, while in the form of emerging pattern it is an outcome of it.** Organization “aims at stemming change, but in the process of doing so it is generated by it” (Tsoukas & Chia 2005, p.199)

Organizing is Sense-making

For Weick, organizing emerges through the process of sense-making as organizing is an attempt to order the intrinsic flux of human action. “A central theme in both organizing and sensemaking is that people organize to make sense of equivocal inputs and enact this sense back into the world to make that world more orderly.” (Weick et al. 2005, p.410) As sense-making and organization constitute each other each need to be grasped to understand the other.

Weick understands organizing as “activity that provides a more ordered social reality by reducing equivocality” (Weick et al. 2005, p.417) and sense-making as an ongoing, social process which plays a central role in the determination of human behavior, as a milestone on the way towards a coordinated system of action. Sense-making “involves the ongoing retrospective development of plausible images that rationalize what people are doing.” (Weick et al. 2005, p.409)

Sense can be made consciously or be modified via unconscious assimilation of subtle cues over time. (Weick et al. 2005, p.415) Sense-making is activated in situations with more or less loss of sense or unfamiliar contexts. When the situation feels different “an expectation of continuity is breached, ongoing organized collective action becomes disorganized, efforts are made to construct a plausible sense of what is happening.” (Weick et al. 2005, pp.414–415). “To deal with ambiguity, interdependent people search for meaning, settle for plausibility, and move on. These are moments of sensemaking[...].” (Weick et al. 2005, p.419)

As efforts at sense-making are triggered when the world is perceived to be different from the expected state of the world sense-making is about the interplay of action and interpretation rather than about the influence of evaluation on choice. (Weick et al. 2005, p.409) “Framing the individual-level puzzle as a question of meaning rather than deciding shifts the emphasis away from individual decision makers toward **a point somewhere ‘out there’ where context and individual action overlap**” (Weick et al. 2005, p.410 citing Snook)

Understanding for Action: ‘What’s the story?’ and ‘What do I do next?’

The focus on sense-making portrays organizing as the experience of being thrown into an ongoing, unknowable, unpredictable streaming of experience in search of answers to the questions, “**what’s the story?**” and “what do I do next?” (Weick et al. 2005, p.410)

To make sense is to **connect the abstract and impersonal**, i.e. a stock of knowledge, with concrete and personal instances through **interpretation and experimentation**. Sense-making is influenced by a variety of **social factors**, eg. previous discussions, remarks, interactions. For example, when knowledge about the correctness of a medical treatment gradually unfolds, the knowledge of this unfolding sense is not located just inside the head

of a nurse or physician. The **locus is systemwide** and is realized in stronger or weaker coordination and information distribution among interdependent healthcare workers. (Weick et al. 2005, p.412) The image of sense-making as activity that talks events and organizations into existence suggests that patterns of organizing are located in the actions and conversations that occur on behalf of the presumed organization and in the texts of those activities that are preserved in social structures. Thus, **communication** is a central component of sensemaking and organizing. (Weick et al. 2005, p.413)

Weick summarizes the distinguishing features of sense-making as follows: they include “its genesis in disruptive ambiguity, its beginning in acts of noticing and bracketing, its mixture of retrospect and prospect, its reliance on presumptions to guide action, its embedding in interdependence, and its culmination in articulation that shades into acting thoughtfully. Answers to the question “what’s the story?” emerge from retrospect, connections with past experience, and dialogue among people who act on behalf of larger social units. Answers to the question “now what?” emerge from presumptions about the future, articulation concurrent with action, and projects that become increasingly clear as they unfold.” (Weick et al. 2005, p.413) Sense-making is understood as “a largely invisible, taken-for-granted social process that is woven into communication and activity in ways that seem to mimic Darwinian evolution”. (Weick et al. 2005, p.417) It represents a **micro-mechanism that produces macro-change over time**, and offers the opportunity to incorporate meaning and mind into organizational theory providing a background for an **attention-based view of the firm**. (Weick et al. 2005, p.419)

Weick questions that shared beliefs are necessary for organized action. (Weick et al. 2005, pp.417–418) He rather expects promising insights from research on collective induction of new meaning than on assembling and diffusing preexisting meaning. Inductions may be more effective when they provide equivalent instead of shared meanings. (Weick et al. 2005, p.418)

6.2.3 Dialogue as Collective Thinking in Organizational Learning

In his famous book on organizational learning, Senge highlights systems thinking as “The Fifth Discipline” (Senge 1990), as *that* important discipline which integrates all required five

disciplines for building a learning organization, which are - as portrayed in chapter 3.2.3 - personal mastery, mental models, shared vision, team learning and systems thinking. “By enhancing each of the other disciplines, it continually reminds us that the whole can exceed the sum of its parts.” (Senge 1990, p.12) For understanding collective knowledge and learning, it plays a particular important role to understand the discipline of real team learning and its phenomenon of **‘alignment’**, which Senge describes as “when a group of people function as a whole.” (Senge 1990, p.217) Although it involves individual skills, for Senge, team learning is a collective discipline and is built on mastering the practices of **dialogue and discussion as the two ways to team conversion**. He admits that there is still poor understanding of collective learning mechanisms and the occurrence of constructive ‘group intelligence’ instead of destructive ‘group think’ is rather a product of happenstance. (Senge 1990, pp.219–221)

In order to fill the conceptual gap, Senge draws on Bohm’s ideas on dialogue and collective thinking. He refers to statements from a series of dialogue and conversation with David Bohm, as Bohm’s book “On dialogue” (Bohm 1996) was not yet published. Bohm’s ideas are informed throughout by a systemic perspective and understand thought largely as a collective phenomenon. “As with electrons, we must look on thought as a systemic phenomenon arising from how we interact and discourse with one another.” (Senge 1990, p.223 citing Bohm) The power of discourse lies in the synergy of its two primary types: discussion and dialogue. While discussion aims at exchanging points of view, however with each member’s aim to ‘win’ and get one’s view accepted by the group, the purpose of dialogue is to go beyond individual understandings so that individuals gain insights that simply could not be achieved individually. (Senge 1990, pp.223–224)

Dialogue aims at paying attention to the whole thought process individually and collectively and changing the way the thought process occurs collectively, because if people were to think together in a coherent way it would have tremendous power – similar to a laser with produces a highly intense light compared to ordinary light by coherent light waves. (Bohm 1996, pp.9, 14) It does so by revealing the three types of **incoherence in human thinking** which are (1) denial of its participative character, (2) running like a program without tracking reality and (3) establishment of its own reference for solving problems. Dialogue helps people to realize the ‘representative and participatory nature of thought’, so that they

become observers of their own thinking and perceive the collective nature of thought. (Senge 1990, pp.224–225)

The result is a free exploration that uncovers people's full experience and thought and moves beyond individual views. "A new kind of mind thus begins to come into being which is based on the development of a common meaning that is constantly transforming in the process of the dia-logue. People are no longer primarily in opposition, nor can they said to be interacting, rather they are participating in this pool of common meaning, which is capable of constant development and change." (Bohm 1996, p.xi) Based on the meaning of the Greek word 'dialogos', Bohm suggested that dialogue should be understood as 'meaning passing through' or 'a free flow of meaning between people'. (Senge 1990, p.223) Without necessity of agreement, everybody shares all assumptions in the group, thus the content of consciousness is essentially the same. In a 'true dialogue', "each person is participating, is partaking of the whole meaning of the group and also taking part in it." (Bohm 1996, p.27) Such a '**true dialogue**' requires a very **considerable degree of attention and awareness** to sense both one's own assumptions and tendencies and similar patterns in the group as a whole. (Bohm 1996, p.ix)

Also for Isaacs, the discipline of dialogue is central to organizational learning as it promotes collective thinking and communication, thus providing a means of "harnessing profound and previously unrealized levels of coordination and insight". (Isaacs 2001, p.709) In his proposed 'action theory of dialogue', dialogue is defined as "a sustained collective inquiry into the processes, assumptions, and certainties that compose everyday experience" and represents "a discipline of collective thinking and inquiry, a process for transforming the quality of conversation and, in particular, the thinking that lies beneath it". (Isaacs 1993, p.25) The aim is to provide a '**container**', **an increasingly conscious environment or 'field'**, in which "people can allow a free flow of meaning and vigorous exploration of the collective background of their thought, their personal predispositions, the nature of their shared attention, and the rigid features of their individual and collective assumptions". (Isaacs 1993, p.25) "A container can be understood as the sum of the collective assumptions, shared intentions, and beliefs of a group. These manifest in part as a **collective 'atmosphere'** or climate." (Isaacs 1993, p.34)

When people learn to perceive, inquire into, and allow transformation of the fields of assumption and constructed embodied meaning they operate in, entirely new levels of insight, change and behavior are possible. “Some of the most powerful forms of coordination do not arise from shared agreement on a plan, but come through participation in unfolding meaning, which might even be perceived differently by different people”. (Isaacs 1993, p.25) Action guiding meaning is stored in all organizations, however, often incoherent and full of fragmented, untested, unexplored interpretations. Dialogue awakens the **dormant capacity** for aligned collective action and creation by **placing primacy on the whole**. It seeks to unveil the two ways in which collective patterns of thinking unfold – conditioned, mechanistic reflexes, and fluid, dynamically creative exchanges – and lets people learn how to think together to enable aligned action. (Isaacs 1993, pp.25–26)

Isaacs proposes that, in order to advance organizational learning substantially, we collectively need to address the ‘crisis of perception’ which basically involves the incoherence of thought as described by Bohm: We become kind of hypnotized by our self-created categories and meanings, thus, and **act mindlessly**. “Our own creations, our thoughts, take on a seemingly independent power over us.” (Isaacs 1993, p.29) “Dialogue is an attempt to perceive the world with new eyes, not merely to solve problems using the thought that created them in the first instance.” (Isaacs 1993, p.30) “By focusing on underlying thinking, dialogue appears to be directed away from producing results.” (Isaacs 1993, p.27) Isaacs proposes that dialogue represents **triple-loop learning**, the inquiry into underlying ‘why’s’ that permits insight into the nature of the processes by which people form their paradigms, not merely as assessment of which paradigm is superior, as in double-loop learning. (Isaacs 1993, pp.30, 38) Dialogue kindles a new mode of paying attention, to perceive – as they arise – the assumptions taken for granted. “Since these are collective, individual reflection would not be enough to bring these matters to the surface. [...] The mindfulness embodied in dialogue involves awareness of the living experience of thinking, not reflection after the fact about it. For us to gain insight into the nature of our tacit thought, we must somehow learn to watch or experience it, in action. This work would require a form of collective attention and learning. Dialogue’s purpose is to create a setting where **conscious collective mindfulness** can be maintained.” (Isaacs 1993, p.31)

Isaacs' theory claims that shared tacit thought comprises a **'field of 'meaning'** and that such fields are the underlying constituent of human experience. Borrowing from Bohm's analogy of dialogue with superconductivity where 'cooled' electrons act like a coherent whole, Isaacs distinguishes between fields of 'hot inquiry' and 'cool inquiry'. In hot inquiry, people collide with each other and make unstable and incoherent associations while 'cool inquiry', i.e. dialogue, cools down the shared environment so that the group's shared attention is refocused on collective thought and shared assumptions, and the living social process that sustain them. (Isaacs 1993, p.32)

Dialogue holds various paradoxes. While it seeks to allow greater coherence to emerge among a group of people (not necessarily agreement), it does not impose coherence. In a similar way, it encourages shared intention for inquiry, but it does not have an agenda, a leader, or a task, but just requires a facilitator to help set up the field and embody its principles. (Isaacs 1993, p.32)

Isaacs conceptualized four evolving stages of dialogue as shown in figure 6.5. The emergence of each phase involves skillful choices and moving through crises for both individuals and the collective. Groups may pass through one level, but can also return to a lower level. The four levels are describes as follows:(Isaacs 2001, p.741; Isaacs 1993, pp.34–38)

- **Instability of the container.** Safety and trust in the dialogue context is of primary concern and an "initiator crisis" may be experienced.
- **Instability in the container.** Polarization, conflict and the clash of personally held beliefs and assumptions may lead into a "crisis of suspension" which triggers first attempts to suspend personal assumptions publicly
- **Inquiry in the container.** Inquiry into foreign ideas and collective activity leads to the experience of a "crisis of collective pain" as the depth of disconnection is held by the group. This opens the possibility for
- **Creativity in the container.** Members begin to think generatively, and new understandings based on collective perception emerge. A new level of awareness opens.

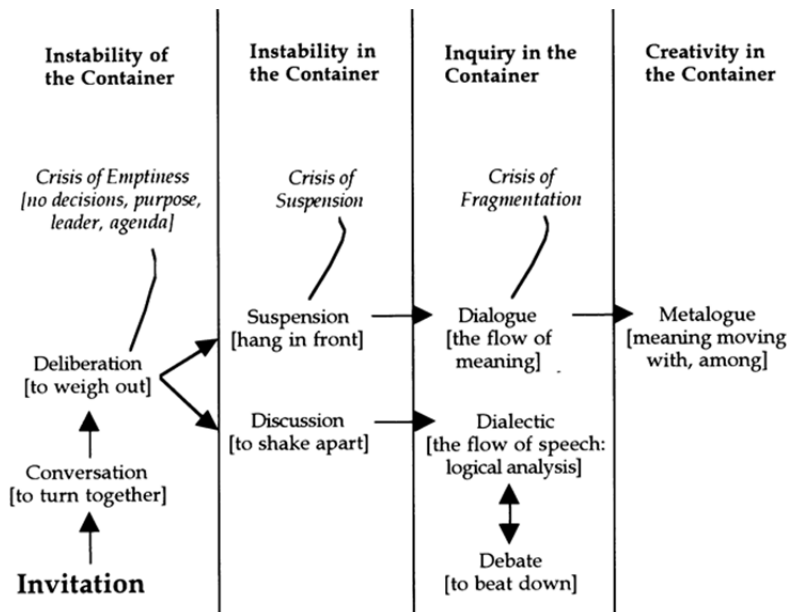


Fig. 6.5: Evolution of Dialogue (Isaacs 2001, p.742)

In the fourth stage, “people begin to know consciously that they are participating in a pool of common meaning because they have sufficiently explored each other's view. They still may not agree, but their thinking takes on an entirely different rhythm and pace.” Isaacs calls this kind of experience ‘metalogue’, or ‘meaning flowing with’. “Metalogue reveals a conscious, intimate, and subtle relationship between the structure and content of an exchange and its meaning. The medium and the message are linked. [...] The group does not ‘have’ meaning, in other words, it *is* meaning. This kind of exchange entails learning to think and speak together for the creation of breakthrough levels of thought”. (Isaacs 1993, p.38)

In contrast to group development models, the primary focus is not on the nature of the interpersonal interactions among the people, but **on the nature of the thought processes** that underlie what is appearing in the group, the quality of the individual and collective reasoning, and the quality of their collective attention. Instead of giving feedback to others, group members’ task is to reflect on own impulses and projections. The nature of collective pattern are discovered from the ground of own experience. (Isaacs 2001, pp.741–742)

Isaacs proposes three principles for enabling dialogue: suspend assumptions, provide a container and use ‘**proprioceptive attention**’, a kind of mindful self-reflection that slows down thinking and opens the possibility for insight. Isaacs distinguishes between two kinds

of attention people may use to support inquiry in any setting, and so influence awareness of the field: reflective attention and proprioceptive attention. “Reflection, even if it is “reflection-in-action” is based in memory—in processing images and information that occurred in the far or recent past. Proprioception (whose roots mean simply self-perception) implies a kind of “on-line” awareness that is not memory based.” (Isaacs 2001, pp.734–735) “In dialogue we seek to cultivate two levels of awareness—reflective awareness and proprioceptive awareness—which could also be stated as awareness of what one is doing as one is doing it.” (Isaacs 2001, p.735) By this, people gradually learn to refine their modes of collective awareness to promote increasingly more subtle and intelligent modes of interaction. (Isaacs 1993, p.35)

6.3 Concepts in Cognitive Science

The science of mind and cognition - traditionally located within disciplines of psychology and cognitive science - has been mostly science of the individual mind. (Wilson 2005, p.227; Weick & Roberts 1993, p.358) The idea that groups may have minds in much the way that individuals have mind has its origin in two distinct traditions: the ‘superorganism’ tradition in biology and the ‘collective psychology’ tradition in social science. (Wilson 2005, p.228)

Biologist Wheeler first proposed an organismal metaphor for insect societies 1911 and coined the notion of ‘**superorganism**’. In a first step, adaptive traits for groups were derived from the natural selection process. In a second step, perceptual and communicative abilities for forage capacities led to the assumption of psychological properties of groups. The notion of ‘**swarm intelligence**’ (eg. Bonabeau 2001) has its origin in this biological tradition, but then reached out into organizational science by the attempt to derive propositions for human behavior in organizations. (Wilson 2005, p.228)

Within social science, the collective psychology tradition can be traced back to two distinct historic notions arising in the last third of the nineteenth century around the perception of a new kind of social entity: the ‘**crowd**’. Gustav Le Bon’s 1895 publication ‘The Crowd’ drew a predominantly negative view of the psychology of the crowd: inferior, primitive and destructive, resulting in a ‘**dumbness of the masses**’. On the contrary, in 1898, Emile Durkheim conceptualized collective psychology as foundation for various cultural

achievements and accomplishments that can only be achieved by groups of people functioning in unison (Wilson 2005, pp.228–229). This attitude then built a precursor of the notions of ‘**collective intelligence**’ (Levy 1994) and ‘**wisdom of the crowd**’ (Surowiecki 2004).

Both notions can be still found in contemporary research: Janis’ concept of **group think** (Janis 1972) describes a mode of thinking in a group that leads to socially negative costs like loss of individual creativity, uniqueness and independent thinking: The desire for harmony and the psychological drive for consensus at any cost may suppress dissent and realistic appraisal of alternatives in cohesive decision-making groups. This negative impact was empirically confirmed by Lorenz (2011) who illustrated how social influence undermines the wisdom of the crowd effect. On the contrary, other studies give promising evidence for the existence of **intelligence** in collective and/or group behavior which is independent from the intelligence of individuals (Woolley et al. 2010; Malone et al. 2010). As a consequence, the relevant question seems not to be whether collective thought and action is inferior or superior, bad or good, but under which conditions collective thought and action results in respective effects.

Wilson distinguishes two claims about collective cognition within the collective psychology tradition. The ‘**social manifestation thesis**’ follows **individualism**, thus, understands cognition only as the property of individuals, and some forms of cognition are manifested only in certain kinds of social context, insofar as individuals constitute part of a social group. (Wilson 2005, p.229) On the contrary, the ‘**group mind thesis**’ argues that group-level cognition exists and groups can have minds in a similar sense in which individuals can have minds. Any psychological traits are not properties of individuals, but features of the group itself. (Wilson 2005, p.229) This dichotomy obviously corresponds to the discussion on whether collective knowledge represents the aggregation of individuals’ sets of knowledge (individualistic, collectivist view) or a distinct category in itself (social, connectionist view). Main interest of this chapter is to explore a cognitive basis for a collectively emerging level of knowledge. Corresponding to the exploration of social, connectionist concepts of collective knowledge in chapter 6.1 and organizational learning in chapter 6.2, this chapter will explore concepts of collective cognition which are appropriate to support the group-level view.

6.3.1 Collective Mind as Heedful Interrelating

One of the most influential and most cited publications on the concept of collective mind has been Weick and Robert's theoretical and empirical examination of mental processes in high-reliability organizations such as flight deck operations on aircraft carriers (Weick & Roberts 1993). They base their ideas for collective mind on two precedent concepts, the concept of 'transactive memory systems' established by Wegner (1986) and the concept of 'distributed cognition' presented by Hutchins (1991; 1995).

Wegner described **transactive memory systems (TMS)** as systems through which groups – people in close relationships or teams – collectively encode, store and retrieve knowledge and which are more complex and effective than that of any of its individuals. A TMS' structure is built by individual memories and a **meta-memory on knowledge** in teammates. (Weick & Roberts 1993, p.358) Access to the whole system is via **communication processes**: "When people trade lower-order, detailed, disparate information, they often discover higher-order themes, generalizations, and ideas that subsume these details. It is these integrations of disparate inputs that seem to embody the 'magical transformation' that group mind theorists sought to understand." (Weick & Roberts 1993, p.358 citing Wegner)

Hutchins' concept of **distributed cognition** has been derived from empirical work on naval navigation teams and suggests that systems maintain flexible but robust action if individuals have overlapping rather than mutually exclusive task knowledge. It allows for redundant representation, thus enabling people to take responsibility for all parts of the process to which they can make a contribution. (Weick & Roberts 1993, p.360) "[The] sequence of action to be taken [in group performance] need not be explicitly represented anywhere in the system. If participants know how to coordinate their activities with the technologies and people with which they interact, the **global structure of the task performance will emerge from the local interactions of the members**. The structure of the activities of the group is determined by a set of local computations rather than by the implementation of the sort of global plan that appears in the solo performer's procedure. In the team situation, a set of behavioral dependencies are set up. These dependencies shape the behavior pattern of the group." (Weick & Roberts 1993, p.360, citing Hutchins)

Weick and Roberts conclude from Wegner that group mind cannot be indexed by within-group similarities of attitudes, understanding or language but requires close attention to **communication processes** among members. They conclude from Hutchins that **global structure emerges from local interactions** and that redundant representation and behavioral dependencies are the substrate of distributed processing. (Weick & Roberts 1993, p.358,360) Taking a connectionist perspective they argue that **connections between behaviors, rather than people, may be the crucial 'locus for mind'**. "Thus, to understand mind is to be attentive to process, relating, and method, as well as to structures and content." (Weick & Roberts 1993, p.359)

For Weick and Roberts, the collective mind is manifested through a **mutually shared field**, which is created through a **pattern of heedful interrelations**. These interrelations are constructed by actions of **contribution, representation and subordination**: "When people act as if there are social forces, they construct their actions (contribute) while envisaging a social system of joint actions (represent) and interrelate that constructed action with the system that is envisaged (subordinate)" (Weick & Roberts 1993, p.363).

As a result, mind is not understood as an entity but as an activity, as an action that constructs mental processes. "Common hallmarks of mind such as alertness, attentiveness, understanding, and relating to the world [are] treated as coincident with and immanent in the connecting activities. **To connect is to mind.**" (Weick & Roberts 1993, p.374) Mind is the disposition to act with heed and collective mind inheres in the pattern of heedful interrelations of actions in a system. (Weick & Roberts 1993, p.360) Redoing this pattern of interrelations that constitute mind renews mind itself. (Weick & Roberts 1993, p.376)

Emergence and **trans-individual** quality is achieved through distributed representation, thus, portions of the envisaged system are known to all, but all of it is known to none. It is not shared representation which is important but **representations' capacity to coordinate contributions**. (Weick & Roberts 1993, pp.374, 365) The focus is on **individuals AND the collective at the same time**: Although only individuals can contribute to a collective mind, a collective mind is distinct from an individual mind because it inheres in the pattern of interrelated activities among many people. It is not the individual 'as such' who determines direction of the process, nor the group action upon the individuals as an external force, but

individuals working with, for, or against each other. These varying forms of interrelation embody the collective mind. (Weick & Roberts 1993, p.364)

Weick and Roberts integrate **heed** into their concept to stress the difference between heedful and habitual actions. While habitual action is a replica of its predecessor and the outcome of drill and repetition, in heedful performance each action is modified by its predecessor and the agent is learning. “Heedful performance is the outcome of training and experience that **weave together thinking, feeling, and willing.**” (Weick & Roberts 1993, p.362) Heed adverbs attach qualities of mind directly to performances – heedful action is associated with action that is careful, critical, consistent, purposeful, attentive, studious, vigilant, conscientious and involves noticing, taking care, attending, concentrating, putting one’s heart into something, thinking what one is doing, alertness, interest, or intentness. (Weick & Roberts 1993, p.361)

“Collective mind exists potentially as a kind of capacity in an ongoing activity stream and emerges in the style with which activities are interrelated. [... It] is **more developed** and more capable of intelligent action **the more heedfully that interrelating** is done”. (Weick & Roberts 1993, p.365) “When interrelating breaks down, individuals represent others in the system in less detail, contributions are shaped less by anticipated responses, and the boundaries of the envisaged system are drawn more narrowly, with the result that subordination becomes meaningless. Attention is focused on the **local situation rather than the joint situation.** People may still act heedfully, but with no respect to others. Interrelating becomes careless.” (Weick & Roberts 1993, p.371)

This is why development of a **group** is not necessarily connected to development of **mind**. While the former refers to **relations between persons**, the latter refers to **relations between actions**. Weick and Roberts give Janis’ above mentioned concept of group think as an example for a developed group with an underdeveloped mind, while temporary systems like ad hoc project teams or jazz improvisation give an example for an underdeveloped group with a developed mind. They build from “**nondisclosive intimacy** that stresses coordination of action over alignment of cognitions, mutual respect over agreement, trust over empathy, diversity over homogeneity, loose over tight coupling, and strategic communication over unrestricted candor”. (Weick & Roberts 1993, p.375)

Using the more processual term '**collective minding**', Cooren (2004) illustrates how concepts of distributed cognition and collective mind can be extended from high-reliability organizations to more mundane situations such as board meetings where people try to offer solutions and make decisions collectively. Here, interrelation is established - thus collective mind is enacted – through **naturally occurring, interactional, conversational mechanisms** in verbal, written, and gestural communication. (Cooren 2004, p.527)

Corresponding to Weick's activities of contribution, representation and subordination, Cooren describes the mechanism as follows: Conversational **turn-taking** creates a joint situation and envisaged system, in which own and others' contributions are represented. Coproducing, amending, completing utterances form building blocks that enact collective accounts, solutions, and decisions. Exchanges contribute to the construction of the joint situation and solution to which they are subordinated. (Cooren 2004, pp.520, 542) Cooren compares the process to Lerner's concept of '**sentences in progress**' - sentences or accounts whose enactment is the conjoined result of at least two participants. They can be collectively achieved through phases of initiation, confirmation, completion, and correction. What is required is not shared cognition but rather **distributed cognition** and representation - the distribution of information and knowledge among co-producers, so that a story can be told collectively. (Cooren 2004, pp.528–529)

The actual and local '**terra firma**' of the board meeting acts as a prerequisite for interaction which is then **transcended** by (re-)presenting and subordinating past interactions, thus 'scaling up' the conversation through time and space. "Although it can only be achieved on the 'terra firma' of interactions, collective minding is shown to be a phenomenon that always transcends the 'here and now' by interrelating this latter with the 'there and then'." (Cooren 2004, p.519) Certain problems, topics or thematic fields enable '**translocalization**' as they serve as a **vehicle** to transport past interactions in time and space and form an issue to subordinate contributions to. (Cooren 2004, pp.534–535) In other words, collective minding emerges from the interrelating while transcending the apparent localness of the interactions. It seems to be impossible to identify the location of the collective as it can be identified only through series of representations that are constantly **operated in its name**. (Cooren 2004, p.525)

As nobody ever submits to an 'ultimate entity' that could be called 'the organization', the **bottom-up** principle is implicit to the process of collective minding. Even if there is a center in charge of coordinating the contributions, these contributions are always "at the mercy of delegations" to members, technologies, and/or documents that participate in more or less heedful interrelating. The collective mind appears "to be relatively **decentered** because it emerges from representing one contribution through another". (Cooren 2004, p.525) Cooren compares it to a **jigsaw puzzle** with no right solution as 'right solution' becomes a matter of negotiation and discussion, a matter of collective sense-making. (Cooren 2004, p.542) Following Weick's concept of organizing as sense-making activity and its shift from decision-making to sense-making, Cooren concludes that collective minding is found as soon as some form of organization takes place, whether in the context of high reliability organizations or in the context of mundane conversation. (Cooren 2004, p.529) The quality depends on the extent to which the sense-making, thus organizing, consists of articulating and **representing several portions of the organization through the here and now of the meeting**. (Cooren 2004, p.541) Thus, comprehensive and reliable organizations are rather built by social contributions, representations, and subordinations than by technologies. (Cooren 2004, pp.543–544) Communicative acts in organizations are not just about processing – they *are* the processing. (Cooren 2004, p.522)

6.3.2 Paradigm of Enaction: Extended and Enculturated Cognition

In their publication "The Extended Mind", Clark and Chalmers (1998) first introduced the idea that cognition extends beyond the skin. They proposed that - under some circumstances - humans routinely engage their wider artifactual environment to extend the capacities of their naked brain. (Clark et al. 2012, p.87) Interaction between individuals and artifacts - like computers, calculators, or even post-it notes – can constitute a coupled system as locus of cognition. The 'Extended Mind Hypothesis' was pursued in Clark's book on "Supersizing the Mind" (Clark 2008) and is now known as "the claim that, under certain circumstances, the dense interplay between neural and extra-neural factors might be such as to warrant talk of extended cognitive processes or even of an 'extended mind'." (Clark 2011, p.448)

The explanation of the assembly of all cognitive factors (cognitive assembly or integration) in extended cognition involves the construction as well as the coordination of a cognitive system – the actual putting together of appropriate parts as well as their coordination and continuous maintenance. Two authors lead the actual discussion: Clark, maintaining an individualistic view of organism-centered cognition, and Hutchins, following a distributed view of enculturated cognition. (Kirchhoff & Newsome 2012, p.166)

For Clark, the ‘extended mind thesis’ supports an ‘extended functionalist’ approach to the embodied mind, where bodily motions play important information processing roles. (Clark 2011, p.448) Plastic neural systems and bio-external support build **‘complex dovetailing wholes’** - extended functional organizations “relative to which the metabolically-determined inner-outer boundary is both analytically unhelpful and computationally far less significant than one might have pre-theoretically supposed” (Clark 2011, p.450) Clark supposes that processes by which neural and bodily resources are brought into fruitful interplay with extra-biological structures to create new temporary cognitive wholes are heavily **brain-based - organism-centered without being organism-bound** - (Clark 2011, p.458) and follow the principle of **‘ecological assembly’**: “The canny cognizer tends to recruit, on the spot, whatever mix of problem-solving resources will yield an acceptable result with a minimum of effort”. (Clark 2008, p.13)

On the other side, Hutchins (2011) argues that Clark’s notion is biased towards the brain as it isolates the assembly activity from the context of cultural historical processes. Hutchins bridges this gap by proposing that **cultural practices contribute organization** to processes of on-the-spot assembly so that the scaffolding of brainbound thinking can be removed. He argues for a broadened hypothesis of **‘enculturated cognition’** holding that ecological assemblies of human cognition make use of culturally constructed assemblies (products) and the original construction process is orchestrated through the joint participation in cultural practices with social others. (Hutchins 2011, pp.441–442) “Thus, real world skill learning typically provides good examples of assembly (process) that is controlled not solely by the biological brain, but by interactions with the organized activity of social others as well. [...] The brain appears as a special super-flexible medium that has causal powers, but when it comes to human cognition, most of the causal powers of the human brain derive from previous experience in cultural practices” (Hutchins 2011, p.444)

In the same way, Kirchhoff explores what he calls a “**third wave of extended cognition**”. He argues that the individualistic notion of cognitive agency overlooks the active contribution of socio-cultural practices in the assembly process of extended cognitive systems and proposes to decentralize cognitive agency to include socio-cultural practices, to conceive of cognitive agency as socio-culturally distributed across groups, cognitive tools, and patterned practices. (Kirchhoff 2012b; Kirchhoff & Newsome 2012)

Various authors have extended the ‘extended mind thesis’ from artifactual to human interaction, thereby breaking ground for a ‘**collective mind thesis**’. Tollefsen (2006) proposes that the extended mind thesis could serve as a stepstone to overcome the individualistic view of cognition. While Clark’s focus was on coupled systems that involve a single individual and an artifact, Tollefsen extends the extended mind hypothesis to coupled systems that are constituted primarily by humans, thus establishing the possibility and plausibility of collective systems. (Tollefsen 2006, p.141) Integrating the idea of ‘transactive memory systems’ into the extended mind hypothesis, she makes a good case for the proposition that environmental resources for cognitive ecological assembly do not solely involve non-biological artifacts but also other biological agents: “If C and C [Clark & Chalmes] are correct, the mind can extend to encompass other individuals”, and when “minds extend to encompass other minds, there is a collective formed.” (Tollefsen 2006, pp.142, 143) When mind is conceptualized as a collection of processes and states and some of these processes relate to resources outside the body, including other agents, then “the divisions between minds or the merging of minds will be determined according to the role agents and artifacts play in these processes and will be fueled to a great extent by explanatory needs.” (Tollefsen 2006, p.147)

Likewise drawing on Wegner’s transactive memory systems and Clark’s extended cognition, Sutton et al. (2010) focus on cases of socially distributed cognition with varying relations between agents and external resources, both technological and social. They conclude that remembering is a product of a “socially coupled system with emergent properties, which in certain cases can be highly integrated and enduring and exhibit high levels of continuous reciprocal causation”. (Sutton et al. 2010, p.547) In order to stress their focus on the rich coupling of individual cognition with its social and environmental situations they suggest the

use the labels of 'distributed' or 'scaffolded' cognition, than merely 'embedded' cognition. (Sutton et al. 2010, p.553)

Theiner et al. (2010) argue that group cognition can be understood as a special case of the extended mind thesis. As bonds of connectivity between people are seen as far greater than to artifacts, groups are identified as the most promising places to look for extended minds that encompass individual people. (Theiner et al. 2010, p.380) Referring to studies on group problem solving and group memory, Theiner et al. illustrates that specific cognitive capacities that are commonly ascribed to individuals are also aptly ascribed at the level of the group. Dense interaction among people leads to both similarity-inducing and differentiating dynamics that affect group's ability to solve problems. Theiner et al. conclude that groups have organization-dependent cognitive capacities that go beyond the simple aggregation of the cognitive capacities of individuals. "The simultaneous and mutual influence of people on each other makes it impossible to simply treat one person as the 'prime cognizer', and the others as mere cognition supporters. As the extent of interactions among people increases, so does the impetus to ascribe functionality to the entire assembly". (Theiner et al. 2010, p.389) **Group cognition is an emergent phenomenon** and global solutions are only available at the group level, not at the individual level. (Theiner et al. 2010, pp.378, 390) They identify three different albeit related facets of emergence and cognition at the group level: organization-dependence, absence of intentional design (manifestation of individually unintended cognitive effects at a group level), multiple realizability of cognitive properties by individuals and groups." (Theiner et al. 2010, p.382; Theiner & O'Connor 2010, p.78)

Another step of extending the extended mind thesis to human interaction takes Krueger (2011). Challenging the dominant Theory of Mind paradigm, he argues that social cognition is a kind of extended cognition: driven and at least partially constituted by non-neural environment and not reducible to individual brain-bound mechanisms. Instead, social cognition "emerges from within the dynamics of the interactive process itself. [...] social *interaction* is a form of social *cognition* – the **self-structuring negotiation** of what I call 'we-space'" (Krueger 2011, p.643). '**We-space**' captures a complex form of social interaction that rests on bodily presence, cooperation and attention. (Krueger 2011, p.645)

As a response, Clark admitted that there may be interesting social and cultural dimensions to the cognitive assembly process whose neglect led him to overvalue the contributions of the biological brain. But he still maintains that it is individual brains – even when working together – that are, in the here-and-now, the most active orchestrating elements in this process. For Clark, **both claims are true and important** - just targeting different timescales and processes of adaption and change. While Hutchins targets at shared human practices, Clark targets at collections of artifacts, however both stress a ‘pivotal role’ of the brain. (Clark 2011, pp.459–460) Clark is fairly convinced that there will be no straightforward empirical resolution to the questions concerning cognitive extension. The perspective that views some cognitive processes as **looping through brain, body, and world** seem to be productive. “By locating that story in a wider framework that displays the neural contribution as itself a manifestation of a **larger imperative** (to structure brain, body, world, and action in ways that work together to reduce informational surprise) we may yet reveal the true nature of that murky family business in which brain, body, and action so potently conspire.” (Clark 2011, p.460)

Kirchhoff and Newsome conclude that brain and cultural practices – in partnership - are responsible for cognitive assembly. (Kirchhoff & Newsome 2012, p.174) They offer a pragmatic notion of cognitive agency “where the situation sets the benchmarks for whether cognitive agency is individualistic or socio-culturally distributed”. (Kirchhoff & Newsome 2012, p.165) Kirchhoff proposes a **new paradigm for cognitive science**, where cognition is understood as a **capacity to enact the world** and the “architecture of cognitive systems is conceived as highly dynamic, context-sensitive, and captured best by holistic approaches”. (Kirchhoff 2012a, p.3)

For Hutchins, it is clear that the cognitive properties of groups can differ from the cognitive properties of any individual in the group. What need to be on the agenda now is to explore organizational principles that determine the cognitive power of groups. “[W]hile everything is connected to everything else, the patterns in the density of interconnectivity determine cognitive properties of the system whether the system is an area of a brain or a group of governmental agencies responding to a crisis.” (Hutchins 2010, p.711)

“A distributed notion of cognitive agency alters the landscape of knowledge attribution in virtue epistemology.” (Kirchhoff & Newsome 2012, p.165) Clark observed that the extended

mind ‘thesis’ had great influence in the philosophy of mind, cognitive science, linguistics, informatics, and ethics, but not yet in contemporary epistemology. “The discipline concerned with one of the most remarkable products of human cognition – viz., knowledge – has largely ignored the suggestion that its main object of study might be produced by cognitive processes outside the human skin.” (Clark et al 2012:87)

Seeing the point of contact between organism and environment not as a boundary but as a locus of essential processes has become known as paradigm of ‘**embodiment**’ in North America, and as paradigm of ‘**enaction**’ in Europe, respectively. (Hutchins 2010, p.710) Joining extended, embedded, embodied and enactive issues of cognition (‘4E Cognition’), enaction unites the ideas of autonomy (as organizational property of cognitive systems, eg. autopoiesis), sense-making, embodiment, emergence and experience. (Kirchhoff 2012a, pp.1–2) Combining phenomenology and cybernetics, it is committed to **circular causality**, self-organization and structural coupling of organism and environment. Environments are not pre-given but are in a fundamental sense created by the activity of the organism. (Hutchins 2010, p.710)

6.4 Summary

Approaches on collective knowledge within knowledge management and organizational learning more or less all formulated certain accounts on three main domains: sense-making, interaction and organizing. As evident from table 6.1, when engaging in thoughts on collective knowledge, the various scholars were guided by different questions rooted in their respective discipline.

<i>Domain/ Author</i>	Sense-making	Interaction	Organizing
Nonaka			
Tsoukas			
Stacey			
Weick			
Senge			
Crossan			

Tab. 6.1: Authors’ Main Area of Contribution to the Model of Collective Knowledge

Aiming at the exploration of principles of a knowledge-based firm, Nonaka followed a broader view including all three domains, but without going in explanatory of detail. Tsoukas then focused on details of **organizing**, Stacey on the ways of complex **interaction** and Weick on the role of **sense-making**. With regard to mechanisms within these three domains, Stacey and Senge highlighted the mechanism of synthesis through **dialogue** as interaction, Weick gave details on the cognitive processes involved in **sense-making** and Tsoukas and Crossan hinted at the mutual feedback and homologous quality of organizing with respect to individual and collective levels. Details on the respective accounts are given in table 6.2 at the end of this chapter.

As each approach follows a different explanatory focus and detail, integration will give a more comprehensive, coherent picture of the nature of collective knowledge. This will be provided in the following chapter based on the insights from concepts in cognitive science which propose that cognitive processes exist outside the individual human skin, in social relating, forming a collective mind.

	(Collective) Sense-making	Communicative Interaction	Organizing
Nonaka	<ul style="list-style-type: none"> * collective sense-making is the mechanism for transcending individual to collective level * shared events -> shared stimuli/commitment/values -> shared experience -> shared culture norms, routines -> shared understanding 	<ul style="list-style-type: none"> * knowledge is constructed and held collectively through continuous social interaction * dialogue & practice * community of interaction (=ba) is locus of CI * trans-subjectivity through dialectic synthesis, conversion in form of social justification and validation * dialogue for synthesizing dialectical thoughts transcends individual's boundaries 	<ul style="list-style-type: none"> * organization = organic configuration of various ba, where people interact * knowledge creation starts at the individual level, amplifies throughout the organization which again impacts individual knowledge
Tsoukas			<ul style="list-style-type: none"> * organization is input AND output of complex interaction * OUTPUT of human interaction - patterns of coordination emerging from actors - self-orga: immanently generated order, self-generating patterns * rules: particular set of concepts/cognitive categories, put into action by individuals collectively sharing its sense * densely connected network of communication for shared understanding * analogy of complexity/chaos to redescribe organization
Stacey	<ul style="list-style-type: none"> * meaning through conversational relating 	<ul style="list-style-type: none"> * knowing is active process of relating * knowledge = properties of interaction/relationship * knowledge is output of processes of interaction between people * individual and social are the same ontological level, just different degrees of details in a fractal process * social interaction = highly sophisticated, circular process of cooperative interaction between people in the medium of embodied symbols, eg. words, in order to take joint action * more interaction -> capacity to take attitude of whole group (social attitude) -> more sophisticated processes of cooperative interaction * human relating intrinsically patterns living human experience as the coherence of continuity and transformation (coh. by meaning) letting knowledge emerge * communication in significant symbols, use of language leads from mindless cooperation to more mindful interaction (raises consciousness) * conversation = gesturing and responding in the medium of vocal symbols * gesturing and responding of one body toward itself = mind * conversational relating creates meaning / lets knowledge emerge * gesturing and responding of bodies towards each other = society (coll. mind) 	<ul style="list-style-type: none"> * knowledge: thematic patterns organizing the experience of being together * individual and social are the same ontological level, just different degrees of details in a fractal process

Tab. 6.2: Propositions on Sense-making, Interaction and Organizing

	(Collective) Sense-making	Communicative Interaction	Organizing
Weick	<ul style="list-style-type: none"> * social process of organizing determining human behavior * interplay of action & interpretation * micro mechanism that produces macro change over time * enables coordinated action * dependent on patterns of organization within action/conversation on behalf of presumed organization * woven into communication * mimics evolution * sense is located system wide, realized in stronger or weaker coordination * triggered by drive to stabilize stream of experience - What's the story? -> retrospective by past exp./social history in dialogue - What to do next? -> prospective by presumptions on future/projections while acting thoughtfully * make sense = connect abstract/impersonal with concrete/personal through interpretation/experimentation * action and talk as cycle -> act thinkingly: choose between old framework and new framework * adaptive sensemaking: honors and rejects the past 	<ul style="list-style-type: none"> * language and communication as means for sensemaking 	<ul style="list-style-type: none"> * activity that provides a more ordered social reality by reducing equivocality (= sense-making) * organizing and sensemaking constitute each other * people organize to make sense of equivocal inputs and enact this sense back into the world to make that world more orderly
Senge Bohm Isaacs	<ul style="list-style-type: none"> * free flow of meaning between people through dialogue * participation in a common pool of meaning 	<ul style="list-style-type: none"> * dialogue as mechanism for collective learning * thought as systemic phenomenon arising from interaction/discourse * dialogue reveals incoherence in human thinking 	
Crossan			<ul style="list-style-type: none"> * situated nature of organizational learning * individual and context are intertwined * levels linked by social and psychological processes * feedforward and feedback * bottom-up AND top-down * emergence and downward causation * think macro and micro * homologous model

Tab. 6.2: Propositions on Sense-making, Interaction and Organizing

7 A Model of Collective Self-transcending Knowledge

After proposing a model of learning from the future in chapter 5 and investigating accounts on collective knowledge in chapter 6, this chapter will first propose an integrated model of collective knowledge and then fuse both chains of thought towards a model of collective self-transcending knowledge as a process of collectively learning from the future as it emerges.

Similar to chapter 5, the procedure will be to first formulate a model of collective knowledge, then discuss specific characteristics of self-transcending knowledge on a collective level, and finally present the integrated model.

7.1 An Integrative View on Collective Knowledge

To start for a collective account on knowledge that integrates the various approaches and distills an essence beyond different terminologies, the circular model of sense-making and cognition as portrayed in chapter 5.1 is used as a platform. Insights from Clark's Extended Mind thesis - and its extension towards an enculturated, collective mind - propose that cognitive processes are not only controlled by processes within the biological brain, but also by 'interactions with the organized activity of social others'. Correspondingly, we can expand the hermeneutic circle of individual cognition from artifacts - a text - to human beings in communicative interaction which 'read a situation'.

Then, Gadamer's 'dialogical relationship' and 'fusion of horizons' between the parts and the whole or present and past is not only established within the individual mind, but amended by inputs and perspectives by other individuals. Krippendorff's evidence on the (self-)organization of the nervous system for sense-making purposes can be expanded to the (self-)organization within a collective. This has been taken up by Weick's account on sense-making as a social process of organizing. Sense-making is conceptualized as a milestone towards coordinated action and manifests through language, talk and communication.

As a first step towards an integrative account on collective knowledge the following propositions can be distilled, partly repeating propositions from chapter 5.1:

Organizing Future

- Cognizing/making sense manifests in a circle of drawing distinctions (features) and relating (meanings) towards a 'sufficiently coherent understanding' (Krippendorf)
- Sense-making is triggered by equivocal inputs, disruptive ambiguity and begins with noticing. It aims at plausibility for actions and (re-)making the world orderly/stable. (Weick)
- Sense-making mixtures retrospect (connection to past experience) and prospect (presumptions about the future). Sense-making is to connect abstract, impersonal with concrete, personal (Weick)
- While individual cognition refers to circular sense-making interactions (cognitive assembly) within the individual domain, collective cognition refers to cognition that manifests in social interactions through heedful relating (Hutchins, Weick)
- Sense-making and organizing constitute each other. Sense-making is a social process of organizing enabling coordinated action. (Weick)
- Sense-making manifests through communication. Communication with oneself - cognitive relating - manifests individual sense-making. Communication with others - affective relating - manifests collective sense. (Stacey, Weick)

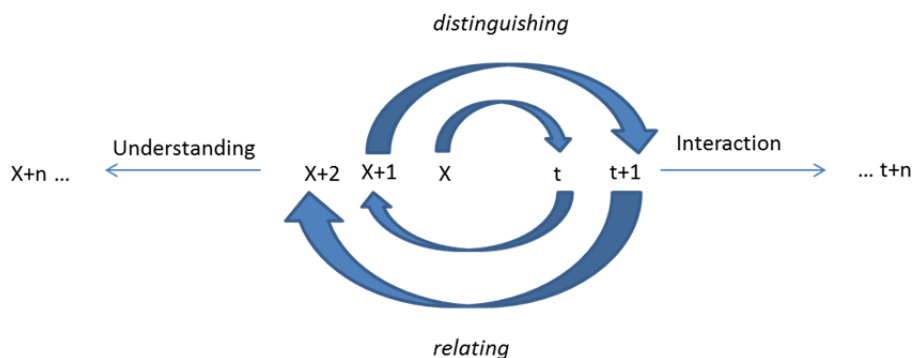


Fig. 7.1: Individual Hermeneutic Circle in Communicative Interaction

Figure 7.1 displays the individual hermeneutic circle in communicative interaction, where 'experience' is replaced by experiences in 'interaction'. When triggered by equivocal inputs within interaction (t), the individual has a certain set of knowledge and understanding (x) which influences (organizes) the way he draws distinctions regarding the issue and its context and the way he interacts. On the other hand, input from interaction (t) influences

(organizes) relating, thus, constructing meaning and increasing understanding to $x+1$. Understanding is amplified within an adaptive process through communicative interaction until the individual gained a sufficiently coherent understanding and is 'in harmony' – the inputs make sense again, reality is ordered again.

Gadamer's view on the hermeneutic circle proposed that in 'the fusion of horizons', the initial appearance of difference itself emerges as a function of the limitations of our starting point. Thus, starting from sense-making, we can say, that individuals make sense out of interaction in order to be able to interact, which adapts sense-making, and so forth. On the other hand, starting from interaction, we can say that individuals interact to make sense, which organizes how they interact, to make sense, and so on. This circular, co-determining approach can be found within most of the accounts on collective knowledge considered in chapter 6:

- Erden's description of the relation between collective action and collective knowledge as a '**growing loop**' in knowledge management (Erden et al. 2008, p.7),
- Crossan's position on the **interactive relationship** between cognition and action in organizational learning: "Understanding guides action, but also action informs understanding" (Dutta & Crossan 2005, p.435)
- Bohm's '**perpetual circle**' of partaking and taking part in a moving dialogue which constantly transforms common meaning (Bohm 1996, pp.ix-x),
- Krueger's co-regulation of 'we-space' in cognitive science: "The expressive activity of one individual shapes that of the other, and vice-versa – a back-and-forth process of continual **reciprocal causation**" (Krueger 2011, p.645)

Figure 7.2 shows the virtual collective hermeneutic circle which emerges from interaction of individual circles. In an analogy to Gamer's circle, the individuals collectively read a text (a situation), which is continuously changed by their reading until it makes sufficient sense for all with regard to understanding and action.

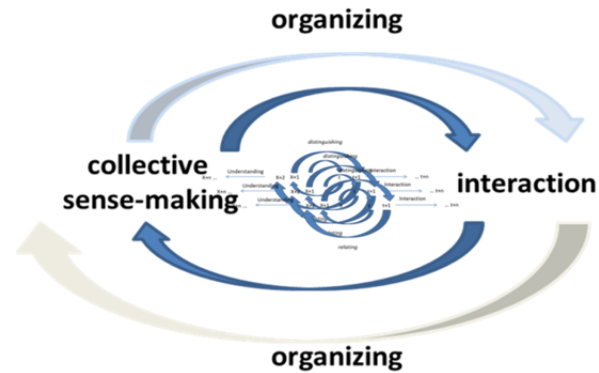


Fig. 7.2: Individual Hermeneutic Circles Converging Towards Collective Sense

The **locus of hermeneutic circles is the individual level**, but they result in organizing rules and patterns of action which show at the collective level. Taking the macro perspective, it seems as if the collective establishes a higher-level hermeneutic circle within a collective mind, where a collective sense converges out of the interaction of its parts. Supporting view can be found in:

- Stacey's proposition (see chapter 6.1.3) that individual and collective processes are fractal processes on one ontological level, just viewed from different perspectives with different detail. "Meaning does not first arise in an individual and is then expressed in action, nor is it transmitted from one individual to another. Rather, meaning emerges in the interaction between them. Meaning is not attached to an object, or stored, but repeatedly created in the interaction." (Stacey 2000, p.30)
- Crossan's proposition that cognition, affect and behavior are the elemental contents of emergence which in interaction of multiple individuals generates the group level phenomena. (Crossan et al. 2011, p.457)
- Bohm and Isaacs' coherence of collective thoughts (not necessarily agreement) as a result of circular dialogue. (Isaacs 1993, p.32)
- Argyris and Schön's concerted meshing of individuals' images of their activity in the context of their collective interaction (Argyris & Schön 1996, p.15)

An integrative account on collective knowledge can now be formulated as follows:

Collective knowledge as collective capacity to act, thus coordinated action, is rooted in collective understanding. This originates from interdependent, mutually constituting processes of **sense-making, communicative interaction, and emergent organizing**.

The link between individual and collective level is established by the **overlapping of individual sense-making circles**. This overlapping extends equivocal inputs and amplifies distinguishing/relating processes for individuals, thus generates feedback processes which show up/emerge as a sense-making circle or process of organizing at the level of the collective entity until they converge towards a 'sufficiently coherent understanding' for each interacting individual, thus a 'collective sense' that organizes collective action.

This does not necessarily mean that the collective sense is a collectively shared sense, a 'sense which makes sense for all'. It is more a distributed sense in a way that individual's senses lead to individual actions that integrate into meaningful collective action reducing equivocality for any of the individuals. This provides a cognition-based underpinning of what Nonaka calls 'social justification', Senge 'alignment' and Gadamer 'fusion of horizons'.

In other words, collective knowledge is rooted in forms of communicative interaction of individuals which establish hermeneutic circles of distinguishing and relating on individual level which converge towards a sufficiently coherent collective sense and organizing rules for action (coherence of interaction).

This basic model of interacting sense-making circles converging towards a collective sense is able to integrate the various approaches presented in chapter 6 into one coherent model, as core domains - sense-making, communicative interaction and emergent organizing – are found in each approach.

Processes of sense-making, interaction, and organizing represent three domains of a fractal process. They cannot be separated as they operate in mutual interdependence, yet, for analytical purposes they will be discussed separately as (individual) cognitive domain, social (=collective cognitive) domain and systemic domain in the following. Each section will briefly

refer to Nonaka's knowledge-based management, if and how aspects of this model can be found or if the model extends Nonaka's view.

Cognitive Domain - Sense-making by Cognitive Relating

Sense manifests through a circular, adaptive interplay of action and interpretation, of action and talk. Sense-making is triggered by 'equivocal inputs', thus, inputs that break experience and destabilize human experience in a certain way. To stabilize experience again, individuals **formulate relations**, i.e. connects the **abstract with the concrete**, the **impersonal with the personal** through adaptive experimentation and interpretation. In doing so, sense-making honors and rejects the past at the same time, integrating retrospective and prospective. Past experiences and social history help in interpreting the issue while **projections and presumptions** on the future help in deciding to act upon. Sense-making continuously chooses between the old framework and a new framework, thus continuously offers the chance to generate new perspectives and new knowledge.

As sense-making is woven in communication, it is the mechanism for transcending the individual level towards the collective level. It represents a micro mechanism that affects the macro level over time. Sense-making is the social process of organizing which enables coordinated action. At the same time it is dependent on patterns of organization within interaction as conversation happens on behalf of a presumed organization. Sense is located system wide and realized in stronger or weaker coordination.

Sense-making plays also a certain role within Nonaka's theory. But it is restricted to the assumption that shared events could generate shared understanding through aligning commitment, values, culture and routines. The details on sense-making given above provide the important differentiation between shared versus distributed collective sense and understanding. What is required for collective action is not necessarily a shared sense, but a sufficiently coherent sense.

Social Domain – Communicative Interaction by Affective Relating

Following Stacey, interaction takes place as a circular process of **gesturing and responding**. Highly sophisticated processes of cooperative interaction in the medium of embodied symbols pattern human experience as the **coherence of continuity and transformation** in order to take joint action. This coherence is meaning - knowledge emerging in present, local interactions as properties of this interaction.

Gesturing and responding towards oneself forms an individual mind, towards each other it forms a collective mind. Thus, individual and collective levels are the same ontological level, just giving different degrees of details of a fractal process. This is what Weick calls 'to connect is to mind'. The collective mind manifests as a pattern of heedful interrelations of actions that create a mutually shared field. **The way members connect their activities makes the system mindful.**

The use of language, i.e. **communication in significant, vocal symbols** such as words, raises consciousness and leads from mindless cooperation to more mindful action. Similarly, a high frequency of interaction raises the capacity to take a collective attitude leading to more sophisticated cooperation.

As knowledge is conceptualized as properties of interaction, new knowledge is rooted in new ways of relating and conversing, be it consciously or unconsciously.

Dialogue is also key in Nonaka's theory. It provides the means for social justification and validation of individual knowledge: In *ba*, the locus of interaction, dialogue synthesizes dialectical thoughts and transcends individual's boundaries. But, details of these as described above have not been provided.

Systemic Domain – Emergent Organizing by 'Relating Relating'

Following Tsoukas, organization is a densely connected network of communication for shared understanding. It is better understood as organizing, as patterns of coordination that emerge from interacting individuals. It manifests through rules, i.e. a particular set of concepts and cognitive categories, which are put into action by individuals who collectively

share its sense. Thus, organizing is input and output of (complex) interaction. Individual and collective levels simultaneously influence each other.

This duality of organizing within the learning process and the necessity to think macro and micro has also been stressed by Weick, Stacey and Crossan. Stacey suggests that individual mind and social relating are fractal processes forming and being formed themselves. Crossan proposes understanding organizational learning as a homologous model where feedforward and feedback loops simultaneously manifest a bottom-up and top-down causation between micro and macro levels.

Crossan's thoughts on the situated nature of organizational learning reflect the perspective of the '**sociology of the situation**': individuals are precipitates of past interactional situations and an ingredient - but not determinant - of each new situation, as a situation is an emergent property. Agency is seen to be always micro, structure concatenates it into macro. At the same time micro-situations are structures, that is to say, relationships among parts. (Collins 2004, pp.5-6) It is this perspective which turns the individual hermeneutic circle depicted in figure 7.2 into a basic element of an emergent process where circles of all participants in communicative interaction overlap and organize in a highly complex way.

Sociology refers to this phenomenon as the '**duality of structure**'. "It refers to the fact that all human action is doubly structured, for it is structured both as a product and as a process, or better, it is both structured and structuring. [...] when linked to the concept of intentionality, it explains how human action can, in the course of its own performance, provide itself with the conditions for its own continuation. [...] by acting we can create the conditions for further action." (Shotter 1983, p.19)

In Nonaka's theory, 'duality of structure' expresses through the dual meaning of social practice. Being an input as well as an output of knowledge creation as described in chapter 6.1.1, it reminds of the dual meaning of organizing as highlighted by Tsoukas. However, although giving socialization the most critical role in creating group tacit knowledge and at the same time considering group tacit knowledge as one of the reasons why people act as a collective body, (Erden et al. 2008, p.6) Nonaka never explicitly recognized this mutual feedback as a self-adaptive process where action of a collective body is socialization and social practice in itself results in new social organizing and rules, thus action.

Integrated Model of Collective Sense-making for Capacity to Act

The integrated model of collective adaptive sense-making and capacity to act is depicted in figure 7.3. It maps collective knowledge as a complex adaptive system and explains the system dynamics through three domains of the system: sense-making triggered by differences, communicative interaction and emergent organizing.

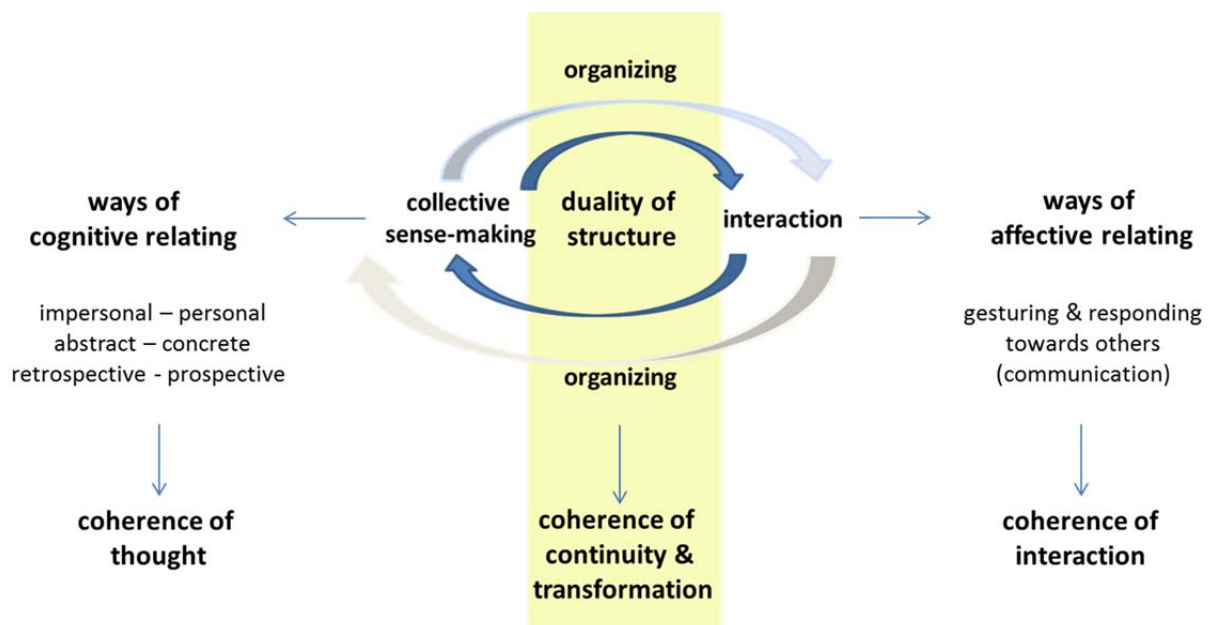


Fig. 7.3: Adaptive Collective Sense-making and Capacity to Act

The dynamic interplay is best described by a statement made by noble prize physics winner Hans-Peter Dürr when interviewed on future creation by an Austrian newspaper:

“Die kooperative Integration des Verschiedenartigen führt zur Entwicklung des Lebendigen, das wirklich neu ist.” (Kurier, Oct 8th 2011, p.46)

In english, ‘The cooperative integration of differences leads to the development of the vivid which is truly new’. This statement crystallizes the three domains of the model of collective knowledge into one sentence: Differences and their integration towards a sense-making relation, integrative cooperation in the form of communicative dialogue, emergence of the new through mutual development of micro and macro levels.

The model of adaptive collective sense-making and capacity to act proposes the existence of various levels of collective knowledge which vary in quality and their capacity to enable collective action. Any interaction manifests to a certain extent a certain kind of sense, thus capacity to collectively act. Any interaction establishes a form of collective knowledge.

However, its degree, quality and novelty are dependent on the extent to which individual sense-making converges to a collective sense, which again is dependent on the ways of cognitive relating and affective relating. Cognitive relating is impacted by a number of enabling factors, such as the existence and perception of equivocal inputs (eg. diversity and variety in individuals' cognitive history or environmental inputs) or certain cognitive capacities of individuals (eg. reflective and proprioceptive attention and mindfulness). Affective relating is impacted by frequency and quality of interaction and dialogue, for example.

In chapter 7.4, this model of collective sense-making will be used to specify the nature of collective self-transcending knowledge as a specific kind of collective knowledge. Before, specific characteristics of self-transcending knowledge are discussed for the collective level.

7.2 Organizational Reflection-in-action, Mindfulness and Foresight

Collective Reflection-in-action

Reflection as a practice of inquiry engages in comparison concerning past, current or future phenomena, thus provides the basis for transformative types of learning from experience. Organizational reflection refers to '**reflection in the co-presence of others**'. (Jordan et al. 2009, pp.466–467) The organizational dimension of reflection – collective critical reflection of organizational roles, practices, routines and power relations - has been a main theme on the agenda of management learning. But, the focus was mainly on reflection-on-action, such as regular quality circle meetings, training sessions, or other routines that take place outside of ordinary ongoing operations. Less is known about organizational reflection-in-action, i.e. routines in the context of ongoing operations. (Jordan et al. 2009, p.467)

Jordan et al. suggest that reflection-in-action is closely linked to the concept of mindfulness. Mindfulness as a state of mind or mode of practice with heightened awareness permits the

questioning of expectations, routines and knowledge in complex social settings. It can be seen as a prerequisite to reflection-in-action: it allows practitioners to reflect on their actions as they go along. Thus, an integration of both perspectives, reflection and mindfulness, can provide the link to organizational reflection-in-action. Collective mindfulness, thus organizational reflection-in-action, manifests both directly in interaction within groups as well as within organizational rules and routines that help organize mindfulness. (Jordan et al. 2009, pp.468–469) Research on mindfulness over the past decade documented benefits of mindfulness such as increase in interpersonal relationship quality and behavioral regulation. (Dane 2011, p.998) As annual research publications on mindfulness are exponentially increasing, eg. from 18-20 in 1999/2000 to 397 in 2011 (Scharmer & Kaeufer 2013, p.164), new insights are to be expected with regard to different forms of reflection and mindfulness and their role for collective learning processes.

Jordan et al. propose that **“the degree and quality of learning within an organization can be regarded as a function of the different forms of reflection and of their interaction”** (Jordan et al. 2009, p.470) Similarly, for Weick, “organizing and organizational learning are dependent on qualities of mind and the way those qualities interrelate.” (Weick & Sutcliffe 2006, p.515)

For Weick, mind in the broadest sense is about a collection of “processes of perception and cognition that induce a rich awareness of discriminatory detail and a capacity for action”. Thus, mindfulness is about patterns or ways of interrelation among these diverse processes of knowing (Weick & Sutcliffe 2006, p.515) and defined as “a rich awareness of discriminatory detail generated by organizational processes” (Weick & Sutcliffe 2006, p.516). When social complexity increases, this rich awareness decreases as people shift from perceptually based knowing to categorically based knowing in the interest of coordination. “If we assume that reliable perception-based knowing is crucial for effective collective action, and that mindfulness is crucial for direct perceptions, then designers should moderate the demands for coordination in any organizational design.” (Weick & Sutcliffe 2006, p.521)

Collective Foresight

Collective intuition and foresight are recognized to be a specific form of group or collective knowledge which requires collective sense-making. (Erden et al. 2008, p.7; Schwandt & Gorman 2004, p.78)

Tsoukas portrays a corresponding notion of foresight which is based on perception instead of prediction and extends foresight, which is usually connected to individuals, to organizations. Based on a perspective that the future cannot be known or planned ex ante, but is created by human beings, the question of foresightful action - of how to act to influence and shape what will be - becomes a relevant question within organizational contexts. (Tsoukas 2005e, p.264) The question is how to deal with discontinuities in a way that does not try to eliminate uncertainty but to take opportunities and give them a form. (Tsoukas 2005e, p.268)

Tsoukas describes foresight in the same way as Scharmer describes self-transcending knowledge: as the **ability to see patterns before they fully emerge, and this ability is rooted in deep understanding**. (Tsoukas 2005e, p.265) So the focus is not so much on the future per se, on predicting or forecasting it, but on **sharpening the organizational ability of perceiving the present**, as done for example within scenario-based organizational learning (SBOL). “The language of scenarios is about the future, but they should make a difference in what is happening now. [...] By seeing change earlier the organization has the potential to become more responsive.” (Tsoukas 2005e, p.268) A foresightful organization has enhanced its **organizational awareness** so that their members collectively become skilful perceivers of the business environment through an **increased capacity to see differences**. However, a sophisticated form of pattern recognition for discontinuities cannot be organizationally formalized but only **informally intuited**. Organizational members need to be sensitive to differences between institutionalized cognitive representations or routines and the local situated context, and need to be able and willing to partially revise and adapt the former. (Tsoukas 2005e, pp.268–269)

Maintaining the difference – the tension – between ‘what is’ and ‘what should be’ (routines) or ‘what might be’ (future) activates the organizational sensory system, just as the human sensory system is activated by differences. Visiting the future to create ‘memories of the future’ and to juxtapose it with current practice enables refocused attention and foresightful

action. (Tsoukas 2005e, p.270) Thus, foresightful action is enabled through greater **self-knowledge**, i.e. clarity about one's behavioral tendencies. **Retro-knowledge** helps understanding current tendencies and **fore-knowledge** induces reconsideration of old aims and habits in the light of expected outcomes or anticipated challenges. For example, fore-knowledge in the form of a corporate vision makes the organization more aware of its potentiality. **Potentialities** are interactively produced and only known after interactions have occurred. In other words, organizations need to 'interact' with scenarios of the future in order to produce (a clearer picture of) its potentiality. (Tsoukas 2005e, p.271)

Thus, the aim of foresight is to secure present activities with a unified meaning by juxtaposing them with past activities and likely future activities. Foresightful action is linked to a quality of organizational learning that encompasses both **retrospective sense-making AND prospective sense-making**. Foresightful action is to act in a manner that **coherently connects past, present, and future**. This can happen in **different qualities**, ranging from simple rational forecasting, to hypothesizing future events and work backwards, to a pervasive skill of foresightfulness, where data dispersed in the stream of time (past memory, present attention, future expectation) is systematically connected into a coherent relationship. (Tsoukas 2005e, p.272) When foresightfulness becomes a background skill, people are subsidiarily aware of the future and the past while focally engaging in the present. In order to become an organizational capability, it needs to be distributed widely across the organization. (Tsoukas 2005e, pp.273–274)

From an organizational perspective, requisite variety of cognitive styles which are required for intuition and foresight can be gained either by all members having cognitive versatile capacities or by bringing together individuals with a blend of detail conscious and big picture conscious capacities. (Hodgkinson et al. 2009, pp.288–289)

7.3 Emergence as Creative, Self-transcending Construction

Goldstein reflects the fact that emergence refers to radical novelty by introducing the phrase of '**self-transcending construction**' (**STC**), indicating a transcending of the antecedent framework or self out of which emergent phenomena emerge. (Goldstein 2004, p.71) Emergent systems would always transcend any particular formal coding scheme adopted to

represent them and emergent phenomena are not reducible in a formal manner to their antecedent or lower level components. What Goldstein means by a STC is a generalized formalization of the self-transcending generation of radically novel outcomes, that is, a generalization of what's involved with processes of emergence. (Goldstein 2004, pp.72–73)

He explicitly draws from the mathematical concept of “**anti-diagonal construction**” which describes construction out of antecedent elements while at the same time transcending each element at every point, i.e. processes which self-transcend the antecedent domains on which they operate. Before, this concept had only been implicitly used as a framework for formalizing emergence within several approaches from Bennett to Piaget. (Goldstein 2004, pp.73–74)

He tries to escape the mathematical language by interpreting anti-diagonal, thus self-transcending construction on the basis of the “**logic of creative processes**” and make explicit what is going on within processes operative in STC and what enables them to generate radical novelty. To characterize emergent processes as ‘creative’ has been a common terminological move, however, the creative process itself, “that set of processes, methods, procedures, and inspirations that have to do with the coming about of the radically original” has never been considered. (Goldstein 2004, pp.73–74) Creative processes neither require sudden leaps nor are they restricted to the creation of art. “Rather, creativity is a pervasive element of everyday life” showing up in innumerable manifestations of bringing about something that wasn't there before. “Moreover, creativity is a phenomenon that can be nurtured and encouraged so as to demonstrate a **blend of intentional construction and spontaneous inspiration.**” (Goldstein 2004, p.75)

“An important aspect of the unique ‘logic’ of creative process can be thought of as a **simultaneous following and negating**, a logic that is connoted in the very phrase ‘self-transcending constructions’ through its suggestion that emergent novelty both comes out of, while simultaneously transcending, antecedent conditions.” **Radical newness implies some kind of discontinuity with the past, while at the same time the generated novelty must be inextricably tied-up with the past.** This essential logic can also be found within the mathematical anti-diagonal construction, so this is why the creative logic serves well to demonstrate the logic beyond mathematical language. (Goldstein 2004, p.75)

Novelty and originality is correlated to the extent to which the new departs from a simple rearrangement of what already has been done by radically modifying it. “The logic behind recombinatory creative strategies is to take antecedent arrangements, follow, at least initially, this extant arrangement, and then change or negate aspects of it as the creative process proceeds.” Negation does not need to imply necessary the opposite, eg white becoming black, but rather all not-white. (Goldstein 2004, p.76) “Creativity reflects a **balance between novelty and connectivity** to previous ideas.” (Goldstein 2004, p.77)

7.4 A Model of Collective Self-transcending Knowledge

When knowledge is conceptualized as properties of interaction, new or specific knowledge is rooted in new or specific ways of relating and conversing, be it consciously or unconsciously. The level of collective mind emerging from interaction was conceptualized as being dependent on the level of heed or attention paid to interaction itself.

Thus, it is proposed that collective self-transcending knowledge emerges, when interaction is performed with the high-quality cognition of self-transcending knowledge, applying it to the content of the interaction and – even more important – to the context of the interaction, thus the interaction process itself.

When propositions from chapter 5 are inserted into the model presented in chapter 7.1, effects will reveal specific ways of cognitive relating and affective relating that constitute collective self-transcending knowledge as a specific form of collective knowledge, and will identify specific attributes of the domains of sense-making, communicative interaction and emergent organizing that are characteristic for collective self-transcending knowledge (CSTK).

CSTK-specific Sense-making/Cognitive Relating

As proposed in chapter 5, self-transcending knowledge varies with qualities of cognition and manifests in its highest form by a **high-quality cognition** that integrates each of four learning modes, three levels of reflection and two time horizons towards a greater **coherence in thoughts** (figure 7.4).

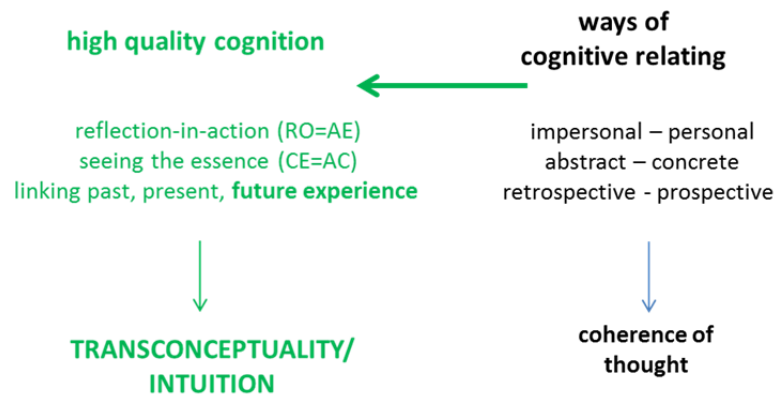


Fig. 7.4: CSTK-specific Ways of Cognitive Relating

This high-quality cognition can be accessed by inquiry involving behavioral, cognitive and existential reflection (triple-loop learning) as described in chapter 5, and significantly raises the **self-awareness of the individual**. The creative logic of following and negating results in transcendence of concepts with regard to content.

As sense-making is activated by the noticing of equivocality or **differences** in the stream of experience, which through relating are integrated into a new coherent understanding as a basis for action, the **sensitivity of perception** as well as its direction, patterns or filters have a considerable influence on creating new understanding, new knowledge, thus new action and future realities, both on individual and collective level. Though, **quality and quantity of attention** are key impact factors. In addition, learning from the emerging future includes a considerable part of prospection within the sense-making process where images of the future are linked with the present and the past. Again, levels of learning from the future depend on quality of cognition used for **prospect** and collective foresight.

CSTK-specific Interaction/Affective Relating

As discussed in chapter 6, emergence of collective knowledge varies with qualities of affective relating and resulting **coherence of interaction**. As proposed in chapter 6, a collective mind creates out of heedful interrelating, thus mindfulness in communicative interaction. For self-transcending knowledge this means that high qualities of cognition need to be transferred to the interaction within social environment itself, i.e. as well to the context, not only the content of interaction.

Drawing on the various levels of group tacit knowledge as portrayed in chapter 6.1.1, various forms of intra-group relating can be described as follows (figure 7.5):

- First, relating abstract concepts and concrete experiences concerning the acts of social interaction means to see the essence of this interaction and can be understood as actually perceiving the collective body, as perceiving the mutually built field, as what Scharmer calls '**field perception**'.
- Second, relating the personal and impersonal, subjective and objective aspects in gesturing and responding towards others can be understood as developing a universal **we-intention** of overall interaction. This can be reached by inquiry into interaction processes through **true dialogue**. We-intention is described by Tuomela (2005) as a "special kind of intention in which the agent we-intends to perform an action jointly with the others or to see it jointly with others that a certain state or event comes about" and can be compared to what Scharmer describes as 'connecting the self to the context of the entire system'.
- Third, relating retrospect and prospect means to link past, present and future of the interaction, thus tackling multiple contingency by being able to guess what other parts of the collective will do next, what might be called an '**intra-group intuition**'.

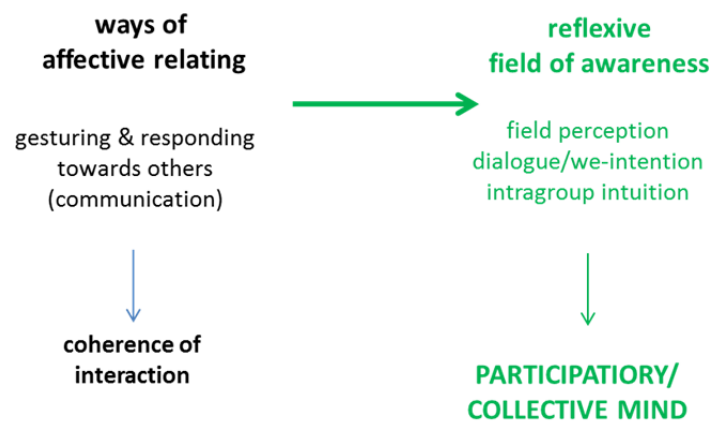


Fig. 7.5: CSTK-specific Ways of Affective Relating

Interactions performed with a high quality of cognition by individuals form a high quality collective mind. This can be gained through triple-loop-learning processes with respect to the interaction, and this in co-presence of others, which in this case raises the **self-awareness of the group**. The creative logic of following and negating results in transcendence of concepts with regard to interaction.

The specific kind of communicative interaction which is able to support self-awareness of a collective is the kind of dialogue as described by Bohm and Isaacs. **Dialogue, a sustained collective inquiry into processes and assumptions** that underlie interaction, is able to reveal incoherence in human thinking and create a common pool of meaning. A common mind arises out of **participation** which is both, to 'partake of' and to 'take part in'. Such a '**true dialogue**' requires high **attention and awareness** to sense both one's own assumptions and tendencies and patterns in the group as a whole. For Isaacs, dialogue represents **triple-loop learning**, a conscious collective mindfulness based on reflective and proprioceptive attention which puts the emphasis on collective thought processes, not on personal interaction.

CSTK-specific Organizing / Coherence of Continuity and Transformation

As discussed in chapter 6, organizing and sense-making are both input and output of complex interaction and individual and collective levels simultaneously influence each other (duality of structure). An emphasis on organizing as input results in formal organizations which aim at continuity in interaction leaving less room for transformation. An emphasis on organizing as output results in self-organization which aims at transforming interaction permanently. In a process of collective self-transcending knowledge, input and output processes of organizing – following and negating of existing organization - are balanced in a specific way across two levels, so that **coherence of continuity and transformation** is ensured on the (individual) cognitive level AND on the (collective) affective level, thus manifesting creative acts of collective action.

Individual sense-making which organizes interaction, as well as interaction which organizes sense-making are in balance to allow for

- (a) the emergence of new content through new ways of cognitive relating regarding content
- (b) the social process of interaction itself by making a sense out of it, and at the same time allowing for its transcendence if required by balancing following and negating of interaction rules.

Effects resulting from the application of self-transcending high-quality cognition to interaction are summarized in figure 7.6.

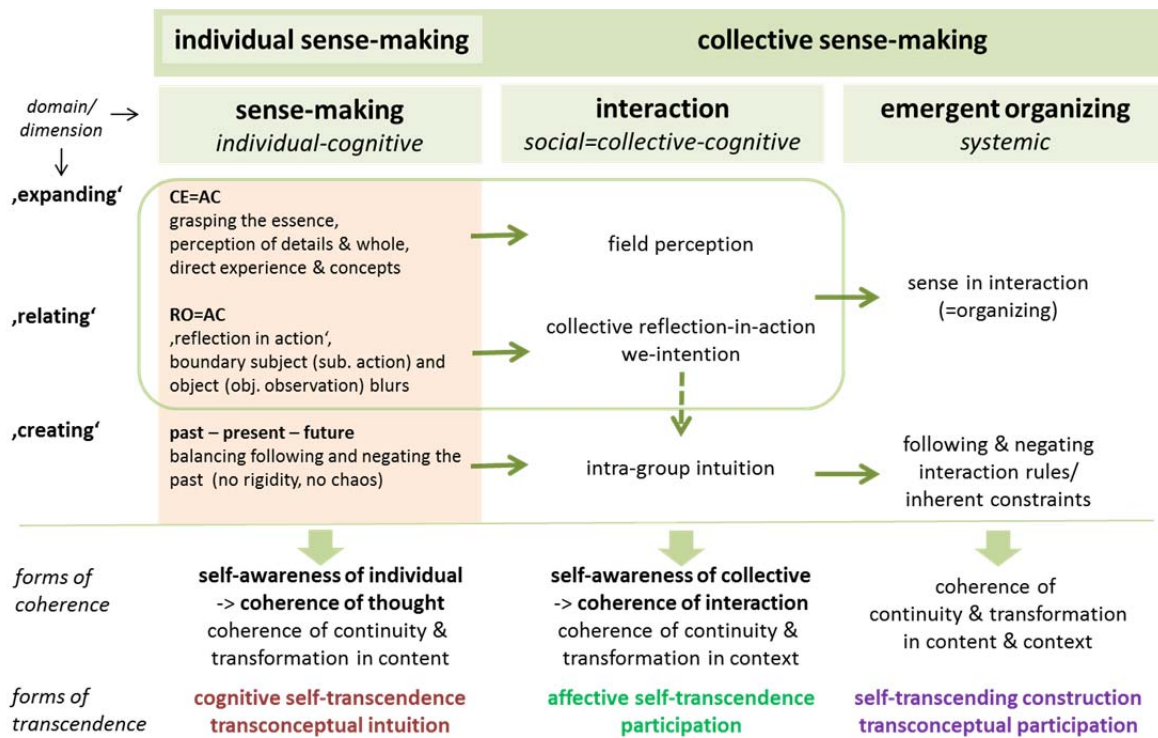


Fig. 7.6: Applying High-quality Cognition to Interaction

CSTK: Connected Reflection and Reflected Connection

Figure 7.8 shows the integrated picture of the whole model of collective self-transcending knowledge: Specific types of sense-making as cognitive relating result in high quality cognition which manifests use of intuition. Specific types of interaction as affective relating result in a reflexive field of awareness (ba) which establishes a participatory, collective mind. These specific types result from increased focus on the creative dimension within the cognitive domain and amending the social domain by a systemic domain.

Characteristics of self-transcending knowledge as derived in chapter 4.4 are reflected in the model. Scharmer's view on space of connection (high-quality cognition) belongs to the **cognitive domain**, Nonaka's view on space of connection (interaction in ba) belongs to the **social domain**. Creation processes belong to the **creating dimension** of the cognitive domain. Emergent self-transcendence refers to the same creating dimension when focused on the individual perspective, but to the **systemic domain when focused on the collective level**. The systemic domain can be regarded as the creative dimension of the collective level. Three dimensions of self-transcending knowledge and three domains of collective

knowledge form a **homologous model with fractal processes** on the individual and the collective level (figure 7.7).

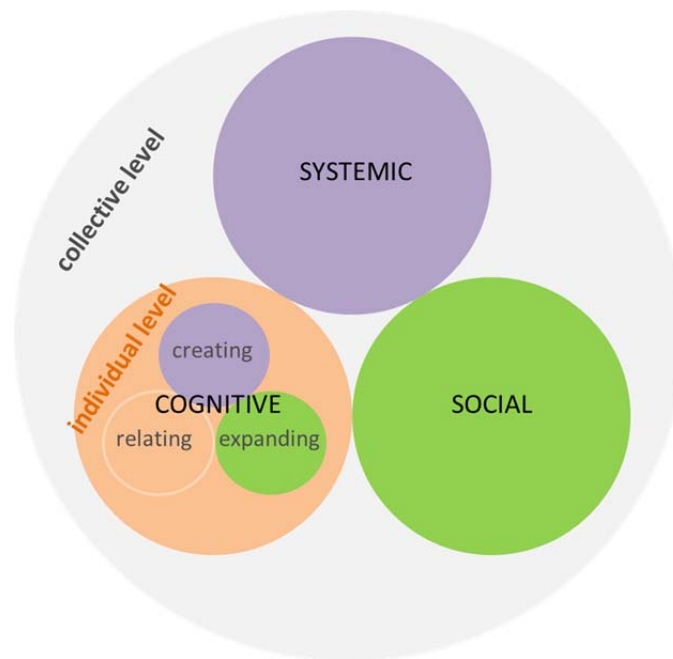


Fig. 7.7: Dimensions of Individual Cognition and Domains of Collective Cognition

Scharmer rather focused on conceptualizing the cognitive conditions, thus cognitive part of self-transcendence, highlighting self-transcending, knowledge creating individual thought conditions. Nonaka rather focused on conceptualizing the affective, interactional part of self-transcendence highlighting self-transcending, knowledge creating conditions of a connecting space. The proposed model integrates both perspectives, providing **co-existence of cognitive and affective self-transcendence** through connected mindfulness and reflection as well as through mindful, reflected, connection. Table 7.1 details main propositions from chapters 3 to 7 which support that model.

To summarize, collective self-transcending knowledge refers to an adaptive process of collective creative action where members of the collective, both with respect to content and collective context, transcend their self-centered and conceptual perception with high cognitive versatility, are aware of the future and the past while focally engaging in the present, so that the collective coherently acts in a way, which would not be accessible for the individual alone.

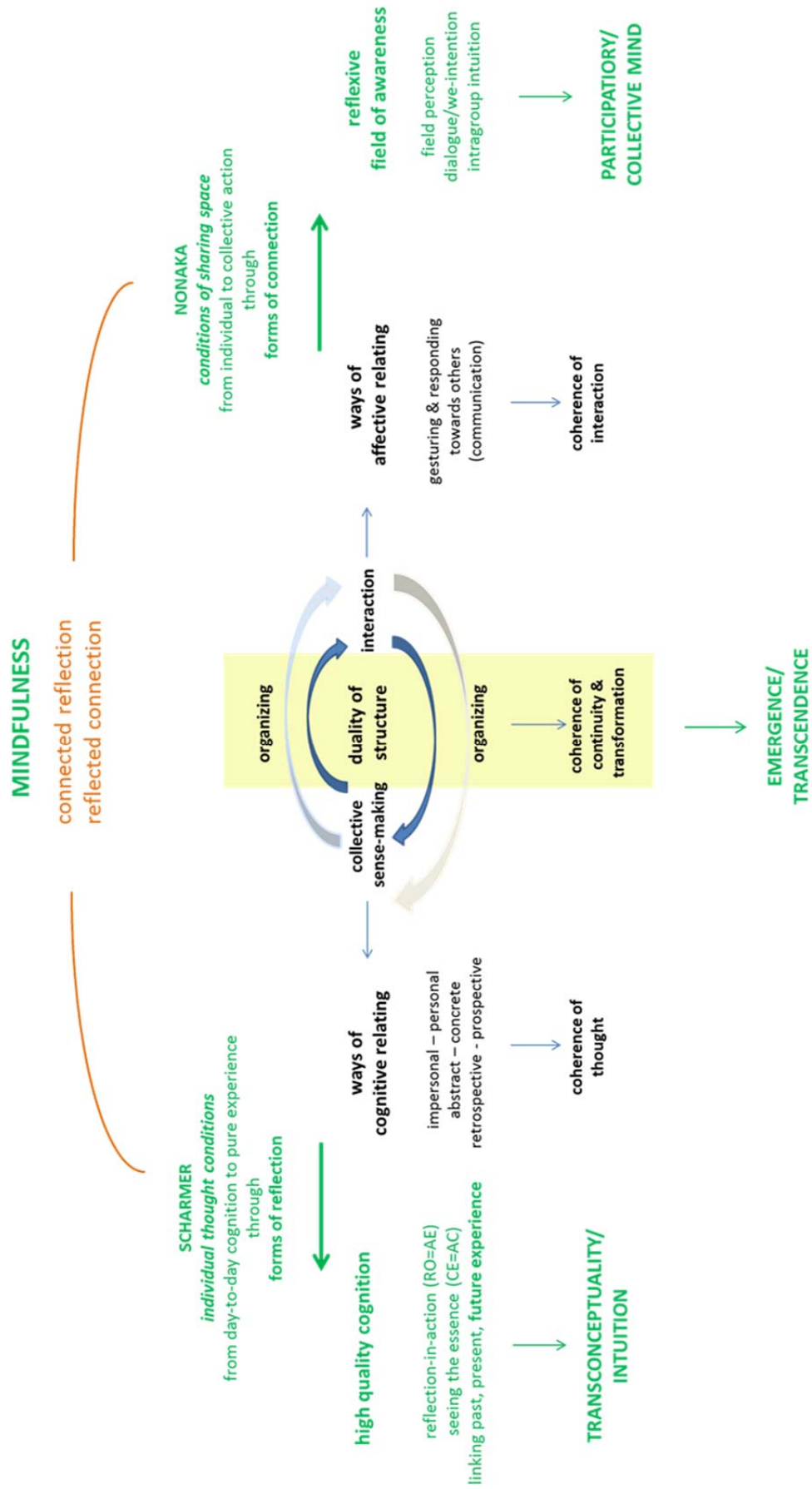


Fig. 7.8: Model of Collective Self-transcending Knowledge

<p>COGNITIVE Domain</p>	<p>3. Knowledge Constructivist epistemology * cognition as circle of distinctions/relations to organize stable reality (<i>Krippendorff</i>) * adaptive, self-organizing process constrained by preceding steps (<i>Glasersfeld, Maturana/Varela</i>) * dependent on subsidiaries and focus of attention (<i>Polanyi, Tsoukas, Virtanen</i>) * Knowledge as capacity to act (<i>Churchman, Argyris, Stehr</i>) * Non-linear relationship between data, information, knowledge and wisdom as transformations of existence (<i>Faucher</i>)</p>	<p>4./5. Self-transcending Knowledge Certain state of consciousness, high quality cognition * pure experience, reflection in action, beyond subject/object separation (RO=AE) * grasp of the essence, perception of universality through details (CE=AC) * third-level reflection * mindfulness enables stable, vivid quality of attention beyond conceptuality (<i>Weick</i>) * triple-loop inquiry as transconceptuality (<i>Starr & Torbert</i>)</p>	<p>6. Collective Knowledge Cognitive Science: * Extended/Enculturated mind: cognitive assembly by organism-external support/organized interaction with social others (<i>Clark, Hutchins a.o.</i>) * Collective Mind as heedful relating (<i>Weick</i>) OL: * Sensemaking is organizing and is to connect abstract/impersonal with concrete/personal (<i>Weick</i>)</p>	<p>7. Collective Self-transcending Knowledge Coll. Mindfulness and triple-loop learning * coll. reflection-in-action as coll. mindfulness (<i>Jonas</i>)</p>	<p>TRANSCONCEPTUALITY coherence of thought</p>
<p>CREATIVE Dimension (of the Cognitive Domain)</p>	<p>Intuition and Prospection * enact the future/intuit form/actualize potential (<i>Scharmer</i>) * envision future based on intuition and understanding of essence and act / inductive jumps (<i>Nonaka</i>) * prospection as central organizing feature of cognition and action (<i>Weick, Tsoukas, Seligman</i>)</p>	<p>Certain state of connectedness * shared context in motion (ba) (<i>Nonaka</i>) * social field structure (<i>Scharmer</i>)</p>	<p>Social KM: (<i>Erdery/Nonaka, Tsoukas</i>) * quality levels of GTK are a function of 'structure of interaction' (coordination, intention, intuition) * CK = IK + rules/organizing * new knowledge by new ways of social interaction * knowledge = distinctions based on context (history) and theory (rules) OL: (<i>Senge, Bohm, Isaacs</i>) * dialogue as collective triple-loop learning revealing incoherence in thinking and creating common pool of meaning</p>	<p>Collective Foresight (<i>Tsoukas</i>) * coherent connection of past, present, future * interaction with scenarios of the future in order to produce (a clearer picture of) its potentiality Creative logic of following and negating (<i>Goldstein</i>) Radical newness implies balance of novelty and connectivity with the past</p>	<p>INTUITION coherence of past, present, future</p>
<p>SOCIAL Domain</p>	<p>Social constructionist, connectionist epistemology (<i>Gerjen, Nonaka, Stacey</i>) * knowledge emerges from complex interaction * social consensus processes of language and meaning making</p>	<p>Two-fold transcendence * cognitive: the new emerges from field of potential/source (<i>Scharmer</i>) * affective: ba emerges from relations (<i>Nonaka</i>)</p>	<p>Complexity-based KM: (<i>Stacey, Snowden</i>) * knowledge = properties of interaction / complex responsive processes of relating * Individ. + social level = ONE ontological level * management by creating conditions OL: (<i>Crossan, Tsoukas</i>) * organization is input AND output * situated nature of OL * bottom-up and top-down feedback * homologous model of micro/macro levels</p>	<p>Common Good * collective wisdom as collective action based on deep collective understanding (<i>Hays</i>)</p>	<p>PARTICIPATION coherence of interaction</p>
<p>SYSTEMIC Domain</p>	<p>Complexity-based View (<i>Polanyi, Goldstein, Hodgsons, Boschetti, Snowden, Peschl</i>) * novel, coherent, macro level, dynamic, ostensive showing (emergence) of knowledge in complex, non-linear, self-organizing systems under certain (enabling) conditions * mutual causation of macro/micro levels * non-linear relationship between data, information, knowledge, wisdom</p>	<p>Emergence as self-transcending construction (<i>Goldstein</i>) * co-existence of design and self-organization</p>	<p>Emergence as self-transcending construction (<i>Goldstein</i>) * co-existence of design and self-organization</p>	<p>EMERGENCE/TRANSCENDENCE coherence of continuity and transformation</p>	

Tab. 7.1: Propositions on (Self-transcending) Knowledge and Collective Knowledge

7.5 Excursus: Aspects of Common Good and Collective Wisdom

Nonaka and Toyama's concept of phronesis as distributed practical wisdom aims at best action in a specific situation to serve the common good. (Nonaka & Toyama 2007, pp.378, 380). Common goodness in this context can be understood as 'good for the group of actors' which may result from negotiations or dialogue between individual perspectives. What is 'good' depends on who defines it and on the specific situation at hand. (Erden et al. 2008, p.9,12) To judge goodness beyond the individual perspective requires a **higher point of view** where general, universal knowledge and particular knowledge of a concrete situation are synthesized. (Nonaka & Toyama 2007, p.380) The 'height' of the view point may determine the extent of the radius for defining 'common': the group, the organization, the society, human mankind.

Ideas that wisdom expresses in the ability to synthesize differences, to link contradictions on multiple levels within a dynamic, cooperative and complex process have been shifted on the collective level by Hays. His dynamic model of a Wisdom Ecosystem (Hays 2010b; Hays 2010a) maps wisdom as a complex adaptive system. Hays' concept of ecological wisdom does not aim at a discussion on wisdom in the academic sense, but instead aims at making "wisdom practical and accessible to teams, organizations, and communities", to provide a tool and process that can bring out the wisdom in collectives. (Hays 2010b, pp.75–76) Wisdom is not understood as an exclusive attribute of a rare minority, but as a **collective phenomenon**. It is understood in ecological terms, based on an organismic metaphor. (Hays 2010b, p.84) For Hays, "wisdom is what allows individuals, groups, organizations, and even societies to solve the most challenging problems in ways that serve the greater good." (Hays 2010b, p.76)

Hays proposes that collective wisdom is an organizational construct and that organizational wisdom is to "recognize that a problem is new and different, and that it might be unwise to respond conventionally to it as if it were a typical challenge" (Hays 2010b, p.78) For Hays, Scharmer's concept of self-transcending knowledge and the notion of wisdom are on the same level, as wisdom is a discrimination skill to assess the differences among situations in order to identify future actions. To be a wise organization does not mean to have ready responses or solutions, but to have "the capability to come to understand the problem

system and, thus, to respond in a more reasons way”, which includes to consider the present situation as well as long-term consequences and the bigger picture. (Hays 2010b, pp.78–79) For Hays, the notions of wisdom and group learning were destined to intertwine. Wisdom is less a matter of accumulated experience but about an increased capacity to learn: Deeper understanding of a problem system can lead to more effective and positive interventions and solutions. (Hays 2010b, p.76,79,82) Thus, collective self-transcending knowledge and collective wisdom are manifested when a collective sees and recognizes differences within the stream of experience – referring to both content and context of the experience - , develops deep understanding of these phenomena and collectively acts towards the future based on this understanding.

Similarly, Peschl describes the domain of wisdom as the domain where “the epistemological and the ontological seem to collapse”. The cognitive system and its knowledge dynamics on the one hand, and the environmental dynamics on the other hand act in a “**dance-like cooperation**”. (Peschl 2007b, p.143) For presencing - the process which manifests self-transcending knowledge - this dance-like cooperation is described as follows: “a knowledge process that is receptive to and ‘honestly’ respects the dynamics and limits of reality, and at the same time fully enacts the cognitive activities of construction. In other words, both the cognitive system and the environmental structures are fully and actively involved in this process and enter into a dynamic of mutual triggering, co-construction, co-creation, respecting, and mutually bringing each other into a state of unfolding and blossoming.” (Peschl 2007b, p.143)

Hays’ term ‘Wisdom Ecosystem’ is to indicate that wisdom is a characteristic and product of numerous mutually-supporting factors, conditions, and relationships (the ecosystem) which operate synergistically, with the result being greater than any of the individual constituents alone or additively. Thus, wisdom dwells in complex dynamic systems – it expresses as a function of interrelationships amongst elements of its system. The ecosystem model shows that collective wisdom is at least theoretically possible and that there are practical steps that can promote it. (Hays 2010b, pp.73–76, 81)

7.6 Enabling Collective Self-transcending Knowledge Processes (Organizing Future)

Duality of Structure

Collective sense-making shows properties of emergence which have been postulated by Goldstein (chapter 3.1.4): novelty, coherence, macro level, dynamic, ostensive showing. These characteristics render emergent processes enigmatic as they elude from explanations based on causality and determinism. (Goldstein 2004, p.66) Boschetti and Gray give the fundamental reason why the process of emergence which appears so obvious proves so hard to define and conceptualize: because in emergent processes it is very hard to separate cause and effect and to discriminate 'who does what':

"When I decide to listen to music, is it my 'emergent' self which takes the decision or my cells? My body depends on cellular activity for its functioning, so cells must be the controlling entities. However, no cell decides to listen to music since listening to music is not something cells 'do'. This leads straight into old and unsolved philosophical problems of causality, determinism and freewill." (Boschetti & Gray 2013, p.2)

Due to non-analytically solvable nonlinearity, the unpredictability of emergent phenomena will always stay one step ahead of prediction, reframing the entire issue of predictability in scientific explanation as it does not yield to more and more probing. (Goldstein 1999, p.60) It requires a rethinking of the role of causality in complex systems manifesting emergent processes, ie. to attach a causal efficacy to both the micro and the emergent macro level. (Goldstein 1999, p.62)

Boschetti and Gray propose to characterize the emergent process in terms of tangled hierarchies exhibiting strange loops: "an interaction between levels in which the top level reaches back down towards the bottom level and influences it, while at the same time being itself determined by the bottom level" (Boschetti & Gray 2013, p.6). This view on the relation between emergence and causality has been studied under the term '**downward causation**' or '**strong emergence**'. (Boschetti & Gray 2013, p.6): A feature is emergent if it has some sort of causal power on lower level entities. While common views of emergence assume that lower level entities must have an 'upward' causation on the emergent features, this

approach requires a **2-way causal relation**. Boschetti et al. give individuals organizing into a community as an example: Their actions affect how the community develops (upward causality) and the development of the community itself affects the behavior and interaction of the individuals (downward causality). This definition has an obvious appeal since it clearly goes beyond the reductionist approach to the analysis of complex systems. (Boschetti et al. 2005, p.575) Corning even goes one step further, suggesting that interactions among the parts and between the parts and their environment *are* the system. The 'whole' is not something that floats on top of it but is at the same level as the parts. (Corning 2012, p.309) Thus, in a strong sense, **there are no two levels but only one level** which is looked at from different perspectives. In other words, the notion of strong emergence and its strong interpretation of 2-way-causation is consistent with Stacey's proposition that individual and collective knowledge are one ontological level.

The corresponding sociological principle of 'duality of structure' was portrayed as the inherent mechanism of the systemic domain. Concerning the question where to start from to form human behavior, it takes a balanced position between structure/socialization and agency/autonomy. Sociologists who have adopted this kind of middle ground are Talcott Parsons in his action theory, Niklas Luhmann in his systems theory and Pierre Bourdieu in his thoughts on habitus and field. In his theory of **interaction ritual**, sociologist Collins suggests to even abandon the agency/structure rhetoric as it confuses micro/macro distinction with active/not-active distinction. He identifies agency not with the individual but describes it as "energy appearing in human bodies and emotions and as the intensity and focus of human consciousness" which "arises in interactions in local, face-to-face situations, or as precipitates of chains of situations". (Collins 2004, p.6)

Self-organization and Design

In search for possibilities to enable such complex processes, the question is how to deal with self-organizing, emergent structures. As a starting point, the notions of self-organization and emergence will be distinguished from another. Wolf and Holvoet, argue that the description of emergence and self-organization as synonyms results in misconception of their meaning. "**Emergence** emphasizes the presence of a novel coherent macro-level emergent (property, behavior, structure,...) as a result from the interactions between micro-level parts. **Self-**

organization emphasizes the dynamical and adaptive increase in order or structure without external control. Both phenomena can exist in isolation, yet a combination of both phenomena is often present in complex dynamical systems.” (Wolf & Holvoet 2005, p.13) Complex **behavior self-organizes as an emergent behavior from interactions** between individuals. Combination of phenomena of self-organization and emergence is a promising approach to engineer a coherent behavior for complex (multi-agent) systems. (Wolf & Holvoet 2005, pp.11–13)

They propose a working definition for **emergence** as follows: “A system exhibits emergence when there are coherent emergents at the macro-level that dynamically arise from the interactions between the parts at the micro-level. Such emergents are novel w.r.t. the individual parts of the system”. (Wolf & Holvoet 2005, p.3) The terminus ‘level’ refers to various points of view. While macro-level considers the system as a whole, micro-level considers the system from the perspective of the individual members.

And they propose a working definition for **self-organization** as follows: “Self-organization is a dynamical and adaptive process where systems acquire and maintain structure themselves, without external control” with ‘structure’ referring to spatial, temporal or functional structure. (Wolf & Holvoet 2005, p.7)

Goldstein (2004) argues that ‘self-organization’ as the pre-eminent account of emergence provided a required corrective to the account that novel order requires imposition from outside. Nonetheless, its connotations “innate, inherent, automatic, unplanned, natural, order for free” have been over-emphasized in contrast to “unnatural, designed, intentional” construction processes. He proposes to approach emergence from a constructional view which encompasses spontaneous, inner-directed processes (self-organization) and constraint-based constructional processes (design) at the same time: “emergence of new order is more appropriately conceived as constructed and not self-organized per se”, which, however, does not imply a ‘constructor’. (Goldstein 2004, p.66)

Goldstein argues that any ‘self-organized’ order emerges from extant or built-in ‘rules’ that construct the ensuing order, be it rules known before or only showing after emergence. Thus, emergence of order is not ‘for free’, but comes from somewhere and by means of constructional operations, with the cost of having been constructed to be so ordered by the **built-in constraints**. (Goldstein 2004, p.69) For Goldstein, the idea of **constraints** is not

restricted to external imposition of order but has to do with “the relational properties parts acquire by virtue of being unified into coherent wholes, that is, an orderly context that embeds and thereby constrains the components of a system [...] constraints can also open up a system to new possibilities by moving it away from pure chance, [...] construction as such can arise in countless ways as lower level parts are constrained by each other and their environments and interact in relation to each other to generate even more constructional constraints.” (Goldstein 2004, pp.68–69)

Thus, attention should be directed at just these **sources of order** and how seminal order is transmuted during processes of emergence. “**Construction in this sense doesn’t necessarily entail an external constructor** but rather can arise out of the interaction of elements which are already ordered to some nascent extent. Self-organization as such may still play an important role but it is no longer over-emphasized as the key to emergence.” (Goldstein 2004, p.70)

The perspective of emergence being a constructed phenomenon implies the presence of **requisite constructional resources** including such factors as (Goldstein 2004, p.70)

- (1) already present, nascent order as well as ordering generating operations,
- (2) ordering constraints,
- (3) containers,
- (4) amplification and recombination strategies which serve to expand and complexify the nascent order.

To summarize, self-organization by itself is not sufficient for accounting for the emergence of new patterns, structures, and properties. Other constructional resources and ‘**constraints**’ along the lines of self-transcending constructional resources are also necessary, processes in concordance with the creative logic of following and negating. (Goldstein 2004, p.77)

Transferring these thoughts to the question of how to enable the emergence of collective self-transcending knowledge, it can be concluded that CSTK constructs without external constructor by resources or ‘constraints’ inherent to the composition of the whole, following the creative logic of discontinuity and transformation, thus, as a blend of intentional construction and spontaneous inspiration. Design and self-organization co-exist, with design referring to inherent or built-in constraints. For the question on how to set up knowledge

processes for collective self-transcending knowledge this means that at first any inherent, built-in constraints need to be carefully considered, for example existing cognitive frames of individuals. Only in a second step, application of external intervention strategies can be considered, whether to correct existing constraints or to impose new ones.

As elements of design and self-organization need to be carefully balanced, 'management' in this case does not refer to its traditional sense but rather follows the principle of facilitation or **enabling**. For Snowden, this means to manage patterns: to identify early signs of a pattern forming, to disrupt undesirable ones and stabilize desirable ones. Certain interventions as the increase in information flow, variety and connectiveness can break down existing patterns and create conditions under which new patterns emerge, although the nature of emergence is not predictable. (Snowden 2002, p.107) "The role of the manager is as gardener or game warden, not mechanic or big game hunter; the consultant becomes a mentor or enabler of descriptive self-awareness ..." (Snowden 2000, p.54) For Snowden, this human capability to direct and structure inter-activity **differentiates human collective behavior from biological swarm behavior**. (Snowden 2002, p.106)

Leverage points for design which crystallize out of the developed model and its underlying theories are listed below:

- authentic **desire and intention** for collective processes and development
- a **holistic attitude** focusing on collective or group as a whole
- experience and **expertise**, both task relevant and meta-process relevant
- provision of **differences and diversity** in all facets: people's skills, functions, backgrounds, knowledge, values, experience, artefacts etc., future visions versus present situation, languages, ...
- high-quality **future work**
- training of **attention** with regard to direction and quality of senses' perception
- relevant **cognitive skills** of individuals: extension, association, openness, balance of following and negating
- three levels of **reflection** as everyday practice: public, in silence, on meta-level
- real **communication**: face-to-face, precise or metaphorical language, candor, in circles, turn-taking
- knowledge processes embedded in **action**

- quality of **connection** of individuals such as durability and frequency
- **heterarchy: freedom** to change, to discover, to act, to play, to dedicate time and leisure
- **care** principle: trust, respect, goodwill, empathy, appreciation of human aesthetic experience
- provision of **physical ba**: terra firma, media, etc.

The leverage points span a space for knowledge creation which are referred to as 'field' by Scharmer, as 'container' by Isaacs and Goldstein, as 'terra firma' by Cooren, as 'we-space' by Krueger, as 'inter-subjective field' by Gunnlaugson, as 'enabling space' by Peschl, or as 'ba' by Nonaka. To a certain extent, the access levers crystallized above reflect prerequisites formulated for the emergence of a knowledge ba in chapter 2.2.3. Though, as they result from modeling of cognitive and social processes they can offer more details, clarifying and amending the principles listed by Nonaka.

Leverage points for 'design', thus facilitation and intervention, can only be found within the cognitive and the social domain. Some may be more important than others but all help to orchestrate collective self-transcending knowledge as they increase the possibility of certain order or results. The systemic domain which is based on the creative logic of following and negating within the cognitive domain is characterized by non-predictability and eludes from being controllable or manageable. Actual results of the creative systemic mechanisms go back to manageable conditions, but, they themselves remain unpredictable, thus unmanageable. What leading business thinkers recognized for sensing and seizing opportunities within strategic management can be applied to enabling corresponding knowledge processes: it involves both a rather **passive part** like "responding to an unfolding pattern" (Mintzberg), "responsive orchestration of resources for coevolution of firm and market" (Teece) or "happenstance and lucky foresight" (Hamel) as well as a rather **active part** like "directing to realize intentions" (Mintzberg), "leading the organization forward to seize the opportunities" (Teece) or "corporate imagination to envision markets that do not yet exist" (Hamel).

8 Conclusion

Within dynamic 21st century knowledge economies, knowledge and the capability to create and utilize that knowledge has been acknowledged as one of the most important sources of sustainable competitive advantage. Knowledge is viewed as the capacity to act and to enact reality. Of particular importance are those kinds of knowledge which bear capacities to create something new, to transcend existing boundaries, to design change, to sense and actualize future potential.

Within the first decade of the new century, scholars within knowledge management engaged in conceptualizing those forms of future-building potential knowledge, like Otto Scharmer's 'self-transcending knowledge' or Ikujiro Nonaka's 'phronesis'. However, their attempts lacked a theoretical grounding in relevant learning theory, organizational learning, systems theory or cognitive science. As a result, it was difficult to derive key principles and leverage factors for designing respective knowledge infrastructures and processes.

Within the second decade of the century, new approaches in knowledge management, organizational learning and cognitive science are developing which bring in cognitive, social and creative aspects of knowledge. Social and complexity-based approaches in knowledge management and organizational learning hold that knowledge and learning resides within complex, communicative interaction of human beings. Organizational learning is not understood as the acquisition of knowledge sets, but arises through participation in social processes. The quality of these social processes is determinant for the quality of the knowledge arising out of them. Recently emerging paradigms in cognitive science (enaction/embodiment) support such view. They suggest that cognition is located and knowledge can be produced in certain processes outside the human brain, even outside the bodily border of the individual, which establish an extended or collective mind.

Based on these new approaches this dissertation formulated a theoretical ground for organizing future-building knowledge in order to facilitate and deepen the exploration of key principles and leverage factors for designing respective knowledge infrastructures and processes. Main propositions of applied theories and how these were integrated into a model of collective self-transcending knowledge is shown in figure 8.1. In a first step, a model of self-transcending knowledge was developed based on constructivist epistemology

and learning theory. A second step integrated insights from knowledge management, organizational learning and cognitive science into a complexity-based view on collective knowledge. Third, a model of collective self-transcending knowledge as a specific form of collective knowledge was derived by applying the model of the first step to the integrated view on collective knowledge. A final step identified dimensions and domains within this model that can provide leverage factors for facilitation of future-building knowledge processes. The steps will be briefly summarized in the following.

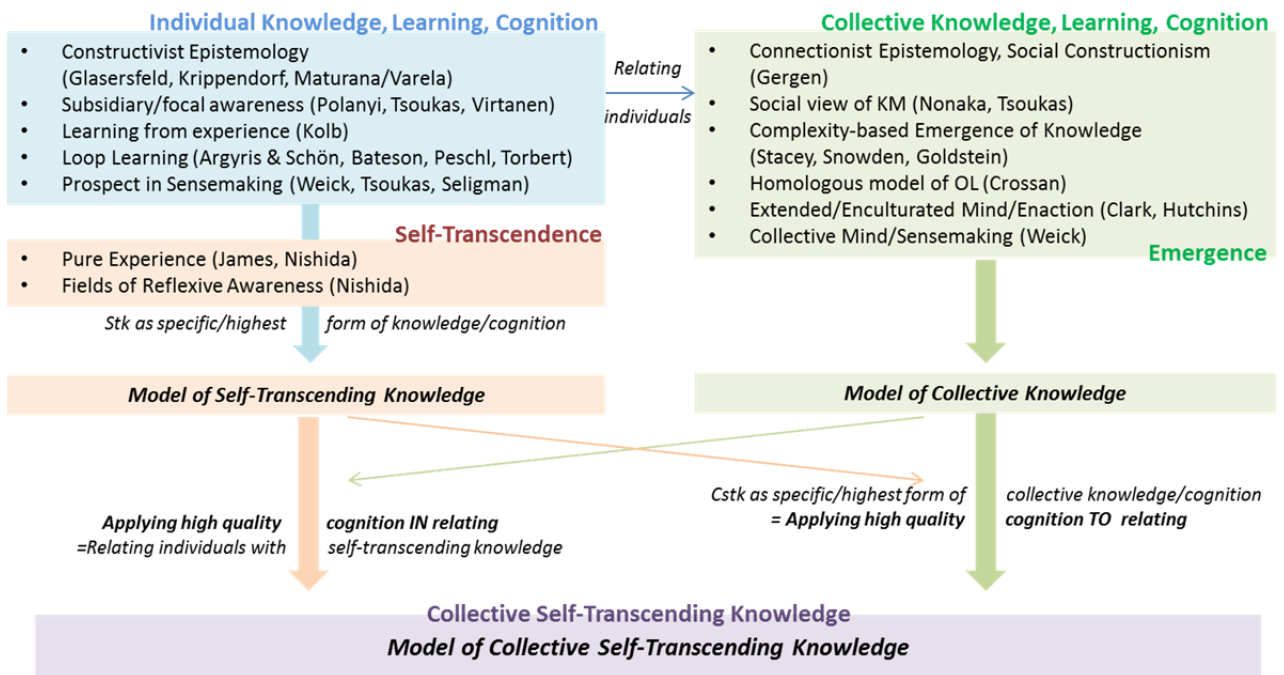
Knowledge – Learning - Cognition

Following the constructivist epistemology, **knowledge** acts as a key to provide functionally fitting ways of behaving and thinking for a subjective reality. The construction of knowledge keeps the subject in harmony and in sufficient coherence with himself and with his environment. Knowledge organizes the subject's reality and keeps him capable of acting.

Due to the continuous flow of new experiences, knowledge is continuously changed, adapted and newly created. To reflect this permanent dynamic it is more precise to speak of an activity or a process of 'knowing'. 'Knowledge' understood as static product does only exist at certain points of time within this process of 'knowing'.

Learning manifests in the construction of knowledge by cognitive processes. Perception of differences which disturb coherence and capabilities to act (grasping experience by 'concrete experience' (CE) and/or 'active experimentation' (AE)), triggers a circular, cognitive, creative process which relates the differences to what is already known (sense-making, transforming experience by 'reflective observation' (RO) and/or 'abstract conceptualization' (AC)). This process re-establishes coherence and offers new capacities to act in a newly organized reality. Thus, learning transforms the learner himself: it utilizes his existing framework of capacities for behaving and thinking (thus knowledge), and at the same time transcends this framework. Dependent on the level of transcendence (behavior, cognition, existence), three levels of reflection and learning are distinguished.

Applied Theories



Main Propositions

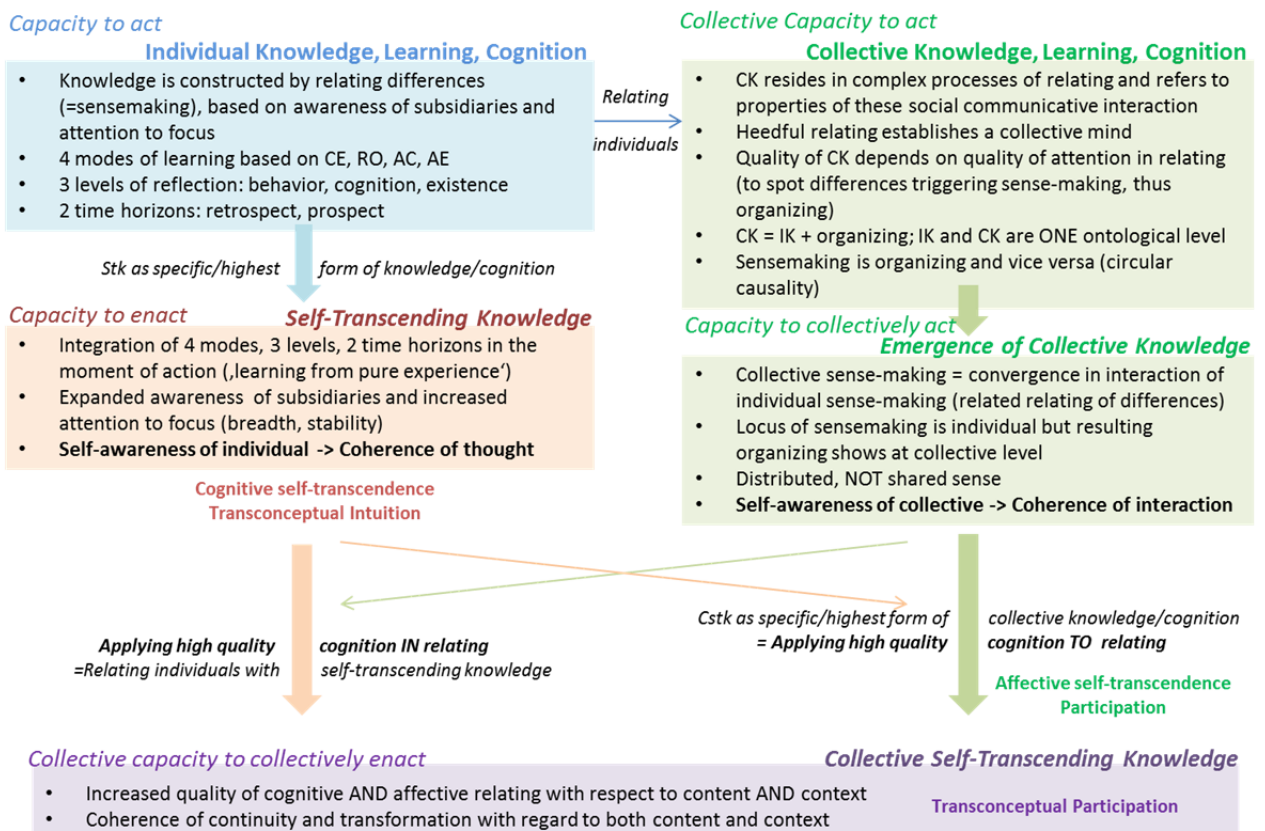


Fig. 8.1: Applied Theories and their Main Propositions

Thus, knowledge is both basis and result of knowledge processes. It results from contents of focal awareness which are given personal meaning by integration of non-focal, subsidiary awareness. This non-focal awareness contains functional keys to subjective reality that have been constructed in earlier processes, i.e. existing patterns of behaving and thinking. It is common to denote this as ‚tacit knowledge‘. It is principally impossible to ‚share‘ knowledge. It is just possible to share artifacts or communicative contents and gestures, which however result in subjectively different knowledge according to subjective subsidiary awareness.

This perspective offers three points of leverage for designing future-building knowledge processes that are to transcend existing behavior and thinking to a considerable extent („radical new“):

- Expansion of the capacity of focal awareness by increased distinction making and perception
- Focus on contents of non-focal, subsidiary awareness, hence its variation
- Expansion of cognitive abilities to relate and associate

High-quality knowledge processes result from awareness of the functionality of these processes. Points of leverage for the coming into being of the new lie in processes around awareness, attention and consciousness. The matter is to increase the quality of attention with respect to breadth, stability and vividness. Quality of attention with respect to frequency has an inferior role.

A Model of Self-transcending Knowledge:

Cognitive Self-Transcendence and Focus on Potentials (Transconceptuality and Intuition)

Future-building forms of knowledge - as described by Scharmer’s concept of ‚self-transcending knowledge‘ or by Nonaka’s ‚phronesis‘ - describe such an expansion of focal awareness („pure experience‘, ‚reflexive awareness‘). Portrayed theories on knowledge and learning can be used to formulate a model which displays future-building forms of knowledge and learning („learning from the future“) as specific and highest forms of knowing and learning. Expansion of focal awareness can be explained as a **threefold cognitive integration**: integration of four modes of learning, integration of three levels of reflection, integration of two time horizons.

- First, there is simultaneously room for concrete details of the actual experience and its relation to the universal context of the whole situation (‘abstract-in-concrete’, CE=AC). Direct experiences and abstract concepts co-exist. (‘**expanding dimension**’, ‘grasping the essence’).
- Second, there is simultaneously room for action and three-leveled reflection (‘reflection-in-action’, RO=AE). The borders of the subject are extended beyond I-personality so that subjective action and objective observation are perceived as one. (‘**relating dimension**’, ‘proprioceptive attention to thoughts’).
- Third, in sense-making, prospection is of the same value and used in the same way as retrospection (‘**creating dimension**’). Prospection reaches a high aesthetic quality so that future, present and past are simultaneously present as experiences. A balance between honoring and rejecting the past in favor of the future enables a creative development which neither falls into chaos nor is stuck in the past.

These seemingly opposites trigger a cognitive process of sense-making via relating which acts creatively and opens up capacities to act which go beyond - transcend - the actor himself. (Cognitive self-transcendence, transconceptual intuition)

This transcendence is based on an expansion of the individual cognitive level. But it is considerably reinforced when it is accompanied by an expansion on the affective (collective cognitive) level.

A Model of Collective Knowledge:

Affective Self-transcendence (Participation)

Following social constructionism, knowledge is socially embedded and resided within the structures of communicative interaction between human beings. Within a collective (as any relating between several individuals) there are two ways to expand the individual focal awareness:

- First, perception of utterances and behavior of other individuals expand distinction making, thus individual sense-making with regard to content. (**Extended Mind**).

- Second, confrontation with various different points of view draws the attention to cognitive patterns itself, and to the meta-level of cognition and interaction, thus individual sense-making with regard to context. (**Collective Mind**).

Interaction which is performed with such a kind of attention does provide opportunities for new forms of relating, within individual cognition, but also on a macro level between individual cognitions. The latter enables the emergence of a collective cognition through converging individual sense-making circles. The degree of convergence determines the degree of collective capacity to act, as sense-making ,organizes' actions and interactions. The model of collective knowledge developed in this dissertation is based on **interacting sense-making circles which overlap and converge towards a collective sense**. Individual sense-making circles are basic elements of an emergent process, where a **collective circle ,self-organizes' through overlapping of the individual ones**. Individual and collective processes are on one ontological level. Just focus of detail separates individual micro and collective macro level of a fractal process.

Collective knowledge is rooted in forms of communicate interaction of individuals which establish hermeneutic circles of distinguishing and relating on individual level which converge towards a sufficiently coherent collective sense and organizing rules for action. (Affective self-transcendence) Forms and attributes of collective knowledge are determined by forms and attributes of interaction (extent, quality, novelty).

The formulated model of collective knowledge describes three domains of a fractal process which can be separated only for analytical purposes:

- **Sense-making** as (individual) **cognitive** domain
- **Interaction** as **social** (= collective cognitive) domain
- **Organizing** as **systemic** domain

Various scientific disciplines (knowledge management, organizational learning, cognitive science) have addressed the three domains with diverse effort and explored partial aspects of the process corresponding to their respective research interests. The model presented in this dissertation for the first time focuses equally on all three domains and integrates them into a transdisciplinary approach.

A Model of Collective Self-transcending Knowledge:

Intertwined Cognitive and Affective Self-transcendence (Transconceptual, Intuitive Participation)

Similar to the step from knowledge to self-transcending knowledge, a model is formulated that describes collective self-transcending as specific and highest form of collective knowledge. As portrayed above, extent and quality of collective knowledge are dependent on extent and quality of the underlying interaction. Collective self-transcending knowledge can be characterized by the **application of the threefold cognitive integration** (four modes of learning, three levels of reflection and two time horizons) **in two ways:**

- First within the interaction process with regard to content, *and*
- Second, to the interaction process itself, with regard to context.

When applying the three-dimensional cognitive integration to the interaction process itself, cognitive transcendence and affective transcendence intertwine. This is reflected on two levels:

- The expanding and relating dimensions of the individual cognition facilitate within the social domain a comprehensive perception of the collective and its whole situation with simultaneous collective reflection and manifestation of a we-intention. This again enables **sense-making of the interaction itself, thus its organizing.**
- The creating dimension of the individual cognition at first provides for intuition and spontaneity with regard to the intragroup behavior, thus within the social domain. This then operates within the systemic domain as balancing the following and negating of interaction structure. Through this it enables the **transcendence of actual, situational senses of the interaction, thus flexibility of its organization.**

The model of collective, self-transcending knowledge describes an ideal state, which is at least theoretically possible. In this ideal state, there is coherence in all three domains of collective knowledge which reflects in a comprehensive collective sense: coherence in thoughts, coherence in interaction, coherence in continuity and transformation, respectively of past and future. In praxis, there are unlimited variations which come more or less close to this ideal state. This depends on the quality of the processes within the three dimensions

and three domains of individual and collective cognition, the resulting collective, organizing sense-making process, and finally its resulting forms of coherence.

Enabling Collective Future-building Knowledge Processes (Organizing Future)

For facilitating collective self-transcending knowledge processes the model provides leverage factors in the various dimensions and domains, eg., education and cultivation of certain individual cognitive skills (cognitive domain), conduction of high-quality future work (creating dimension), selection of individuals according to cognitive, communicative skills, attitudes, and experience (inherent constraints in the social domain), facilitation of certain forms of interaction and cooperation (facilitation strategy in the social domain).

Yet, as elements of design and self-organization need to be carefully balanced, 'management' in this case does not refer to its traditional sense. It rather follows the principle of facilitation or enabling which embraces paradox of being active and passive with a certain modest attitude. The systemic domain which is based on the creative logic of following and negating within the cognitive domain is characterized by non-predictability and eludes from being controllable or manageable. Thus, actual results of the creative systemic mechanisms are based on manageable conditions, but itself remain unpredictable, thus unmanageable. Leverage points for 'design', thus facilitation and intervention, can only be found within the cognitive and the social domain and mainly refer to changes in structures of attention and consciousness which turn unreflective into reflective practice. Some may be more important than others but all help orchestrating collective self-transcending knowledge – organizing future - as they increase the possibility of certain order or results.

Contribution of the Work

This dissertation deepened crucial aspects of collective knowledge creation and ways to come to it. Using a framework for collective cognition, which was derived from the enaction paradigm within cognitive science, it constructed a theoretical link between sense-making, collective cognition, social action and collective self-transcending knowledge.

Starting from Nonaka's state-of-the art theory on knowledge-based management, the emphasis on collective future-building knowledge led to its clarification and extension:

First, focusing on future-building thought processes which lay the ground for the knowledge spiral, clarified epistemological roots and disclosed how original philosophical concepts have been fused within Nonaka's concepts of 'ba' and phronesis. Integration of Nonaka's and Scharmers' concept of future-building knowledge gave the whole picture. Underpinning them with insights from learning theory and sense-making, this dissertation highlighted the importance of prospect and its quality in organizing collective action. **Effective learning from the emerging future includes a considerable part of prospection within the sense-making process where images of the future are linked with the present and the past. Levels of learning from the future depend on quality of cognition used for prospect and an increased capacity to notice differences in the present.** Visions provided from external and/or the top, or conceptual prospection without reference to present or past, i.e. pure rational or wishful thinking may lead to a rather low level of self-transcending knowledge. Prospection based on high-quality cognition as described by pure experience may result in a coherent stream of experiencing past, present and future, thus the highest level of learning from the emerging future: pure **intuition** or foresight grasped from within.

Second, bringing in insights from complexity-based approaches then extended Nonaka's position. His question on the relationship between organizational knowledge creation and social practices was answered by: it is the same. Also for Nonaka, elements such as value-guided vision, dialogue and social practices belong to an enabling infrastructure that build space, a 'ba', for the creation of knowledge. But he imagined a linear mutual feedback between separate sense-making within top and middle management, rather than complex emergence of knowledge by overlapping sense-making: "The organization is in a state of becoming, moving between cycles of sense-giving from the top and sense-making in the middle, to sense-giving in the middle and sense-making at the top." (Nonaka et al. 2006, p.1192) This leaves a certain degree of control with management, such as top-down provision of corporate vision. This dissertation built an ideal model of the emergence of collective self-transcending knowledge which in practice comes in various ways, dependent on qualities and interdependence of the processes within the cognitive, social and systemic domain. In other words, Nonaka's view can be understood as a special case, where the

creative dimension of the cognitive domain is not left to individual's intuitive balance of following and negating but determined from a top level outside by separating the respective sense-making process from the system.

The integrated theoretical model developed in this dissertation, for the first time, focuses equally on all three domains – cognitive, social, systemic - and integrates them into a transdisciplinary approach. It provides key principles and leverage factors for future-oriented business management as portrayed in chapter 2.1. By theorizing knowledge processes that include vision and intuition and that create and let evolve emerging future, it provides starting points for inventing technologies to access such knowledge. Findings may serve as a starting point for a variety of adjacent research themes, which could be the focus of subsequent projects, e.g.:

- Further empirical refinement of identified leverage factors,
- Case-study research with companies of various sizes and organizational structure in order to test the framework on a broad quantitative empirical basis.

The developed model can account for aspects of wisdom and common good so that it supports Nonaka's and Porter's view on common good as a business value and may provide a starting point for its further refinement. The question whether a bunch of people becomes a 'dumb mass' or a 'wise crowd', can be answered by the following: it depends on the capacity of its sense-making and organizing processes to develop a collective mind instead of group think. It does not make sense to relate and align persons, i.e. their personal cognition, opinions and sympathies. But it does make sense to heedfully relate their actions towards collective action through attention to their various cognitions, opinions and sympathies, thus opening the door to transcend them and collectively enact something new.

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