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Peschl, M.F. and T. Fundneider (2013):

Theory-U and Emergent Innovation. Presencing as a method of bringing forth profoundly new knowledge and realities

In O. Gunnlaugson, C. Baron, and M. Cayer (Eds.), Perspectives on Theory U: Insights from the field, pp. 207–233. Hershey, PA: Business Science Reference/IGI Global.

URL: doi:10.4018/978-1-4666-4793-0 (24.10.2013)

local file name: ***pesc13 Peschl Fundneider Theory-U and Emergent Innovation.pdf***

internal note:

bibliographical data

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@incollection{pesc13,
 AUTHOR       = {M.F. Peschl and T. Fundneider},
 TITLE        = {Theory-U and Emergent Innovation. Presencing as a method of bringing forth profoundly new
knowledge and realities},
 EDITOR       = {O. Gunnlaugson and C. Baron and M. Cayer},
 BOOKTITLE    = {Perspectives on Theory U: Insights from the field},
 YEAR         = {2013},
 PAGES        = {207--233},
 ADDRESS      = {Hershey, PA},
 PUBLISHER    = {Business Science Reference/IGI Global},
 URL          = {doi:10.4018/978-1-4666-4793-0 (date of download: 24.10.2013)},
 KEYWORDS     = {Design | Innovation | Organisationales Lernen | emergent innovation | Innovation |
Presencing | Scharmer, C.O. | potential | new | future | socio-epistemological technology | }
}
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Theory U and Emergent Innovation.
Presencing as a method of bringing forth profoundly new knowledge and realities

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Version: 5.1 | April 17, 2015

Abstract: One of the big challenges in the field of innovation is to create something radically new and at the same time something that has been "waited for", although nobody has explicitly known or seen it; something that—despite its perhaps radical newness—appears just in the right time at the right place ("kairos") and organically fits in the existing environment (be it a market, an organization, a culture, or society). This chapter introduces an alternative approach to innovation and presents both its theoretical foundation and a concrete well-proven innovation process: *Emergent Innovation*.

Besides other concepts from the fields of innovation, cognitive science, and epistemology, this approach is based on C.O.Scharmer's Theory U. It will be shown that a new kind of "cognition and epistemology of potentiality" is necessary in order to accomplish such processes as "learning from the future" and "listening to the future as it emerges". It involves a whole new set of cognitive abilities, attitudes and epistemological virtues, such as radical openness, deep observation and understanding skills, reframing, etc.

The second part of this chapter presents the Emergent Innovation approach that applies these theoretical concepts in a concrete process design. It is a socio-epistemological innovation technology bringing forth profoundly new knowledge and innovations having the qualities

explicated above. The practical concepts, the implications as well as the learnings from and for Theory U will be discussed.

Keywords: Emergent Innovation, future, knowledge creation, knowledge space, innovation, presencing, radical innovation, Theory U,

> "Self-transcending knowledge—the ability to sense and presence the emerging opportunities, to see the coming-into-being of the new—is usually associated with artists, not business managers. For example, there are three ways to look at a painter and her work: … third, one can watch the painter before she lifts a brush, as she considers the blank canvas… 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, 2007, p. 137f)

Introduction

What is profound innovation and how can it be brought about? These are the questions guiding not only this chapter, but—to some extent—also C.O. Scharmer's (2007) *Theory U*. In our days, the notion of innovation seems to be omnipresent in business, politics, science and technology, and even in the social and cultural context (consider the field of "social innovation"; Thackara, 2005). However, taking a closer look reveals that innovation is a widely misunderstood and misused notion that is invoked whenever something seemingly new is presented or discussed. In the first part, this chapter aims at clarifying these misunderstandings in order to develop an alternative approach to innovation which focuses on one of the most difficult issues in this field. It concerns the following dilemma: On the one hand one expects from most innovations that they are radically new; i.e., they break with previous patterns and offer a completely new experience, service, or perspective. On the other hand, in many cases, the users, the organizations, or the market are not capable of dealing with this radical newness, because it does not fit anything that has been known so far. As an implication this innovation is "too new" and is not accepted by potential users, because it is

simply “too far out”. Hence, there is a tension between a really radically new perspective and the way it fits into already existing structures.

One of the reasons for this problem of not being able to emotionally accept or cognitively “understand” such a radical innovation lies in the fact that it is—in most cases—the result of rather unstructured processes of knowledge creation, such as “wild brainstormings”, “out-of-the-box” thinking exercises, or creativity workshops (Kelley, 2004; Sternberg, 1999). The outcomes of such processes are not only “crazy” ideas, but sometimes really interesting radically new insights potentially leading to radical innovations. As stated above, in many cases their problem is that they do not fit anywhere, as they do not have any “connection points”—neither to the market nor to the organization having generated these so-called innovations.

The aim of this chapter is to develop a possible way out of this dilemma by introducing the concept of *Emergent Innovation*. This socio-epistemological innovation technology draws on C.O. Scharmer’s (2007) Theory U and shows how it can be successfully applied and developed further in the context of innovation processes. By elaborating on an alternative epistemology having its focus on cultivating potentialities that want to break forth or emerge, Emergent Innovation offers an alternative approach by suggesting “radical innovation from within”, from the core of the object or phenomenon of innovation.

In the second part, this chapter develops the theoretical foundations for such a perspective on innovation. We refer to this type of innovation as profound or emergent innovation: it is a radical yet organic innovation, because it has (been) developed out of the potentialities of the core of the innovation object. In a second step, a process and design for applying these theoretical principles in a concrete innovation process design is presented.

Finally, we sketch the concept of *Enabling Spaces* (Peschl & Fundneider, 2011). These spaces provide an integrated multidimensional social, architectural, cognitive, emotional, epistemological, and technological environment enabling these processes of Emergent Innovation. We discuss what can be learned from Scharmer’s Theory U and how it could be developed further both in some theoretical and practical aspects.

Setting the Stage for Innovation: Strategies for Creating New Knowledge

The "Innovation Hype"—Asking Some Critical Questions

How does the new come into the world? How should we deal with new and unexpected situations? Which strategies are we applying for creating desired futures that bring about a real and sustainable change? These questions have a history and tradition almost as old as mankind. There seems to be an interest for tackling these questions in various domains, ranging from economics, societal issues, technology, our everyday lives, to science and the arts. Many initiatives focusing on the enhancement of the topics of innovation and knowledge creation have been launched around the globe during recent years. For example, the European Commission (2008) announced the year 2009 to be the "Year of Creativity and Innovation"; it also developed and is in the course of implementing the EU innovation strategy until 2020 (the "Innovation Union[1]; European Commission, 2010).

As a result of these activities, many techniques, "recipes", approaches, and processes claiming to bring forth radically new knowledge or innovation have (re-)emerged over the last years. However, even if all these efforts seem quite worthwhile, we have to take a closer look at their premises and ask ourselves some critical questions: What are we really doing here with respect to creating game-changing innovations? To what end are we putting so much energy into these activities? What is their "causa finalis"? How are we bringing about all this so-called new knowledge? What are the systemic implications of these innovations?

Why we Have to go Beyond Classical Approaches to Innovation

We want to seriously question both the quality of the many "new" ideas, knowledge, and innovations brought forth as well as the underlying approaches leading to these innovations. Looking more closely at these questions and taking them seriously one can discover a close connection to Scharmer´s Theory U (Scharmer, 2000, 2007; Senge, Scharmer, Jaworski, & Flowers, 2004). Scharmer's Presencing approach does not only open up an alternative perspective on how one can look at creating new knowledge and innovation, but also on what is a sustainable, profound, and really meaningful innovation (in the sense of an innovation being connected to a "higher end"). Hence, the sections to come address the following questions: How do we create profoundly new knowledge from deep

[1] See also http://ec.europa.eu/research/innovation-union/ or http://i3s.ec.europa.eu/home.html [accessed Dec 12, 2012]

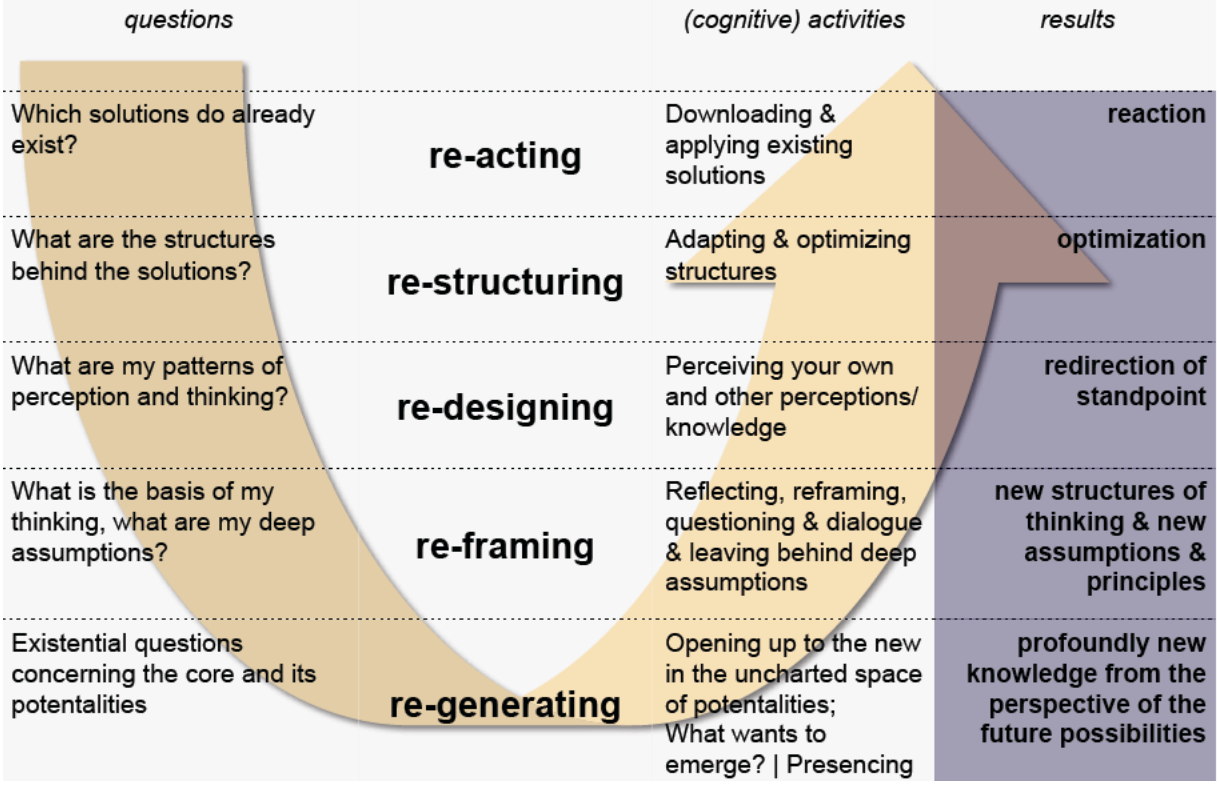
understanding? Why is successful radical innovation so rare and so difficult to achieve? What are alternative strategies for innovation and knowledge creation, if one applies radically different socio-epistemological paradigms, such as the Presencing approach? How can they be practiced? What is sustainable innovation and how can it be brought about? What contexts enable these kinds of knowledge processes, such as "*Enabling Spaces*" (Peschl, 2007a; Peschl & Fundneider, 2011)? How should such multi-dimensional interdisciplinary spaces be designed?

Scharmer´s Theory U and Presencing approach are among the foundations, which unite the topics being addressed in these questions—not only as a theoretical framework, but also as a set of epistemological (*attitudes*), social (*values*), and as a kind of perspective on the world ("*worldview*"). One of the underlying topics both of these questions and of Theory U concerns the challenge of change and how to cope with change.

Innovation as Tackling the Challenge of How to Cope with Change and with the Demand for the New

Coping with change and creating new knowledge are at the heart of any innovation process. In most cases the challenge is how to respond to this change with a strategy that is based on new knowledge; or, even better, to *anticipate* this change and proactively shape the future in such a way that newly created knowledge can act as the foundation of reaching a beneficial dynamic state for all participating systems. From a knowledge perspective, the latter represents a triple challenge: one must not only react to a change which has occurred already; rather, one has to (a) *anticipate* this change, (b) relate it to a possible future state of one's own knowledge (be it in one's own business, human resources, technology, or society), and (c) shape a whole future scenario which integrates these domains in a radically innovative way (for example as radically new knowledge, a business model, service, or product). This is arguably a highly sophisticated form of dealing with the challenge of change.

Figure 1: Strategies of how to deal with change (adapted from Scharmer, 2007)



In order to achieve a proper understanding of innovation processes in the context of Scharmer's Theory U approach we will locate them in a framework giving an overview and combining these two fields in this section. As can be seen in Figure 1 we have slightly adapted Scharmer's (2007) model of levels of change in order to discuss different levels and strategies of how to deal with change and, hence, how to learn, create new knowledge, and come up with innovations.

I. Reacting and Downloading

Reacting and downloading is the easiest and simplest way of responding to change (Scharmer, 2007, p. 119ff). This is not only known from biology and neuroscience, but also from organizational theory (e.g., Baecker, 2002; Scharmer, 2007). Already existing and well established behavioral, organizational, perceptual, or proven cognitive patterns are applied to solve the problem or the learning/adaptation task. This is the most convenient and the most economic way of reacting to change, because it requires only searching for and *downloading* (Scharmer, 2001, 2007) already prefabricated solutions, knowledge, or behaviors. In other words, reacting implies applying patterns from the past to current challenges or changes. In

organizations these patterns from the past are realized in established processes or in "best practice" approaches.

This mode of dealing with change is applied by cognitive systems and organizations most of the time. This is not a bad thing in itself. Having at one's disposition a well proven repertoire of reactions is the foundation of any functioning system or organization such as routines, well established processes, or fixed stimulus-response cycles or reflexes (in cognitive systems). By providing basic functionalities and routines they are a necessary condition for the stability and the survival of a system in routine situations.

As is shown by Scharmer (2007) the mode of reacting becomes problematic, if environmental or internal changes are so dramatic that established patterns from the past do not fit and do not offer an adequate solution any more. The situation becomes even worse, if these patterns from the past have such a strong influence that it becomes impossible to "recognize what you see" (p. 126), because they block a clear view. In fact, these barriers are among the toughest obstacles to overcome when starting any kind of innovation project.

Hence, reducing the behavioral repertoire to a more or less sophisticated system of reactions (e.g., by mapping a company to a "landscape" of business processes), can be risky because: (1) the reactions are highly rigid and (2) the resulting solutions or changes do not go very deep and in most cases do not even scratch the surface of underlying issues of the problem of the issues at hand, or of the real challenge lying behind the change.

II. Restructuring and Adapting

Going one step further, the approach of *restructuring and adaptation* takes more seriously the problem of rigidity and solely reacting to changes. At this level, the solution is achieved by not only applying already existing knowledge patterns, but also by using these patterns as a blueprint which is adapted and modified slightly to the current situation. From a cognitive and organizational perspective this is a highly efficient learning strategy, because it is not as rigid as downloading, and can be done with minimal cognitive or organizational effort; namely, to make use of already existing knowledge, patterns, or business processes, change them slightly and apply them to the new situation or task.

From the field of cognitive neuro-science these processes are well understood—these are the classical learning and adaptation processes well known from the domains of connectionism or computational neuroscience (see for example, Bechtel & Abrahamsen,

2002; Gazzaniga, 2000; Peschl, 2001; Rumelhart & McClelland, 1986). From this perspective it becomes clear that these approaches are mathematically equivalent with processes of *optimization*. That is, we are searching for an optimum solution in an already pre-structured space of knowledge or solutions. In an organizational context this strategy is known as *sinlge-loop learning* (Argyris & Schön, 1996; Kolb, 1984; Peschl, 2006). Most scientific innovation is based on this strategy: a more or less well-established scientific paradigm is exploited by exploring the pre-structured knowledge space by optimizing the epistemological fit between a theory/model and the corresponding phenomenon in the environment. Kuhn (1970) refers to such a process of adaptation and optimization within a paradigm as 'puzzle solving'.

These processes of optimization normally lead to *incremental innovations* (Ettlie, Bridges, & O'Keefe, 1984). This means that the 'level of newness' is not very high; the results are not really surprising, as they are always within the already established framework of reference or paradigm. Nevertheless, this mode of reacting to change is highly efficient as it provides a means for creating an adequate response at a relatively low level of risk and economic effort.

III. Redesigning and Redirecting

One of the central questions driving this strategy of coping with change is: How to get out of the framework of reference one is trapped in? How to (re-)move the blind spot which affects our full perspective of things. The focus of this strategy is to explore primarily one's own patterns of perception and thinking in order to be able to assume new perspectives going beyond the boundaries of a given paradigm. The main tools for this strategy are radically questioning of one's premises and reflecting on them.

In this process the focus of attention shifts from the external object to the source of one's cognitive and perceptual activities—this shift is referred to as *redirection* (e.g., Depraz, Varela, & Vermersch, 2003; Varela, 2000). The viewpoint changes radically: one tries to view the world through one's own patterns of perception—one looks at the world by looking *through* oneself. This can be done individually; however, it is much more effective in a collective setting. The goal is to arrive at a position from which it is possible to take different standpoints and to understand what one's own patterns of perception and thinking are—these insights act as a starting point for creating new knowledge spaces and for the following level of reframing.

IV. Reframing

Downloading, adapting, and optimizing are sufficient for mastering most everyday problems and challenges. These solutions are not very interesting from the perspective of radical change or profound innovation, because they do not bring forth fundamentally new knowledge, insights, or understanding. As we have seen above redirecting opens up a new space of knowledge by discovering one's own patterns of perception and, by that, creating a new perspective. Fundamental change is always connected with reflection of deep assumptions and stepping out of the—more or less consciously—chosen framework of reference. It involves going beyond the boundaries of the pre-structured space of knowledge and re-framing it in the sense of constructing and establishing new dimensions and new semantic categories.

This process concerns the level of mental models, premises, and deep assumptions, and working to fundamentally change them. In dialogue-like settings (Bohm, 1996; Isaacs, 1999a, 1999b) these assumptions are explored through double-loop learning (Argyris & Schön, 1996). As opposed to single-loop learning, which is focused on incremental improvements or changes remaining within the chosen paradigm or framework of knowledge, double-loop learning reflects, questions, and changes this framework of knowledge.

Taking this process of reflection one step further leads to the construction of completely new conceptual frameworks, new knowledge and paradigmatic spaces enabling the reframing of already well-established cognitive structures. These structures function as the basis for *radical innovations* (Ettlie et al., 1984; Garcia & Calatone, 2002; Jacoby & Rodriguez, 2007). In the philosophy of science these shifts to completely new conceptual frameworks are referred to scientific revolutions or paradigm shifts (e.g., Kuhn, 1970).

V. Re-generating, Profound Existential Change, and "Presencing"

At a more fundamental level, change goes beyond reframing and the level of cognition altogether. At this level of change, questions of *finality, purpose, heart, will, and being* come to the fore. What these questions all have in common is that they concern an *existential* level rather than merely the level of cognition.

From a learning perspective these processes are realized in the *triple-loop learning strategy* (Peschl, 2007b). Triple-loop learning focuses on a change on the existential level, such as a change in attitudes, in habitus, in deep values, or deep purpose. It turns out that most of the cognitive, emotional, or behavioral domains are based on and embedded in this

existential level. At this level, change is not solely based on cognitive reflection any more, but more importantly on *existential reflection* and learning. In a way, the goal is to bring the existential level of the person and the organization (i.e., its acting as well as its core understood as what is the essence of this organization) into a status of inner unity and alignment with itself and with its future potentials as well as with (external) future requirements. What might sound esoteric is in fact a very old theme and philosophical issue going back at least to Aristotle's philosophy and metaphysics. What is referred to as the "core" corresponds to the concept of essence or substance from metaphysics (e.g., Aristotle, 2007). In many cases these questions concern the concepts of the core/substance, *potentia*, and *actus* (see below for details) of the innovation object and of wisdom (e.g., Aristotle, 2000, 2007; Stein, 1986).

Due to its existential character and its focus on being completely immersed, Scharmer (Scharmer, 2000, 2001, 2007) refers to this mode of change and learning as "*presencing*". It represents an approach to innovation which does not primarily learn from the past, but which shifts its focus towards "*learning from the future as it emerges*" (Scharmer, 2007, p. 52). The goal is to be intellectually very close to the innovation object ("becoming one with the phenomenon"; Scharmer, 2007, p. 148) and at the same time be completely open to "what wants to emerge" (out of the surrounding, out of the organization, its humans and its knowledge). The difficult part in this approach is (i) to profoundly understand the situation (that is, the core of the innovation object) and its context, (ii) to match these insights with the potentials that want to emerge, and (iii) to bring them into a consistent and integrated picture.

In short, the process of presencing concerns a fundamental examination of the core of the innovation object leading to a profound, holistic, and integrated understanding of this object including its context. Further, only a highly nurturing environment for generating profound new knowledge may give rise to radical innovations that are not only radically and fundamentally new and emergent but that are also aligned with what wants to emerge in the person, society, the organization, or in culture in general. What we are talking about here is the problem of sustainable and radical innovation.

Integrating these modes of knowledge creation

These strategies of coping with change and innovation do not exclude each other; in most cases aspects of almost every level are present in one way or another in innovation processes. The important question for any organization is where it shifts its center of attention

and activity to. For instance, Nonaka and Toyama. (2003) SECI model (Socialization, Externalization, Combination, and Internalization) focuses on the interplay between implicit and explicit knowledge and how this interplay may act as a source for generating new knowledge. It is concerned mostly with Levels II and III of the categorization above (see also Figure 1).

Generally speaking, it is clear that Levels III to V from above are *cognitively and intellectually* rather challenging and demand for an explicit culture of openness, innovation, and real commitment to questioning oneself, to reflection, and to radical innovation both on an individual and a collective level. From an innovation perspective, these levels are most interesting, because they offer the potential to bring about radical innovations having deep economic, social, scientific, or cultural impact. Hence, for our purposes it is essential to explore the following question in the sections to come: How can innovation and change processes of Levels IV and V be realized in organizational settings? Before doing that we have to take a look at classic approaches to innovation in order to better understand the context in the field of innovation.

Incremental vs. Radical Innovation

In the field of innovation studies (Ettlie et al., 1984; Fagerberg & Verspagen, 2009) one has to differentiate between two types of innovation, which are important for understanding the context of innovation. Ettlie et al. (1984) distinguish between processes of *incremental* and *radical* innovation.

Incremental innovation is characterized by minor changes and optimizations, which do not touch the underlying concepts of the object/phenomenon of innovation. According to Henderson and Clark (1990), "…incremental innovation refines and extends an established design. Improvement occurs in individual components, but the underlying core design concepts, and the links between them, remain the same" (p. 11). This type of innovation is closely related to Level II above (see also Figure 1).

While incremental innovation strives for optimization (see Level II of Figure 1), the focus of radical innovation is on changes in the more profound domain of core concepts or base principles. In most cases, making changes in these fundamental domains results in radical changes in the whole product or service in addition to its context (for example, by opening up or even creating completely new markets or systemic environments).

> Radical innovation, in contrast, is based on a different set of engineering and scientific principles and often opens up whole new markets and potential applications... Radical innovation often creates great difficulties for established firms and can be the basis for the successful entry of new firms or even the redefinition of an industry. (Henderson & Clark, 1990, p. 9)

In other words, radical innovation starts off with changes on the level of the assumptions and premises on which the object/phenomenon of innovation is based (see Level III and IV of Figure 1). According to Arthur (2007):

> A change in principle, then, fits with our intuition of what constitutes a novel technology. I will therefore define a new (radically novel) technology as one that achieves a purpose by using a new or different base principle than used before. (p. 278)

The word "radical" has its origin in Latin ("radix") and means root. Hence, radical innovation or radically new knowledge means a *change in the root* of this knowledge. This change in the root of knowledge implies a reframing of perspectives on the given phenomenon and, thus, a change in the whole structure of the knowledge space.

Innovation as Irritation: Reframing Perspectives and Knowledge Spaces

Creating new knowledge as the key challenge and source for innovation. Experience shows that innovation is among the most challenging processes in the context of organizations, knowledge management, as well as in one's personal life. The creation of radically new knowledge is the key for almost every domain in a business or organization—even more so, if the main product or service is focused on non-material products, services, or knowledge. What makes innovation processes so difficult and challenging? Primarily because they have something to do with the future and how to "behave" in the future; more specifically, with constructing knowledge which has to fit both into external future changes (including the resulting new requirements) and to what and where the organization will be at this point in time (for example, concerning its technology, knowledge, or human resources). In most cases these future states are almost impossible to predict accurately, because the underlying social, economic, technological, and knowledge dynamics are far too complex.

The process of innovation through knowledge creation is similar to what is happening in science and technology: one is trying to predict an aspect of reality in order to increase the

level of control over this aspect and the only way one can achieve this is to create new knowledge and apply it in various contexts. However, if we remain in the regime of control we only have half of the story of what innovation is about. Control is mostly concerned with preserving the current state; thus, it is rather backwards oriented. Taking a future perspective, however, means that we look forward and actively try to change and bring forth new realities. This is by far the more interesting and challenging task of innovation and knowledge creation. Knowledge creation as "learning from the future", as Scharmer (2007) puts it, is the key to such a sustainable foundation for any innovation process.

In any case, knowledge plays a crucial role as a condition *sine qua non* for bringing innovation into existence. Hence, innovation and knowledge are intrinsically coupled in a complex epistemological process: (i) acquiring knowledge (via observation, for example), (ii) abstracting and constructing knowledge (understanding), (iii) creating new knowledge; (iv) realizing this knowledge in concrete prototypes; (v) fast cycle learning processes on these prototypes; and (vi) embodying this newly generated knowledge in the organization.

Getting irritated by new knowledge spaces. Whenever we are confronted with radical innovations, radically new knowledge is at its root. This knowledge is embedded in new knowledge spaces that have emerged out of a process of reflecting existing premises and, as a consequence, of systematically changing them. While incremental innovation exploits existing knowledge spaces, radical innovation creates new knowledge spaces by reframing the axes of the knowledge coordinate system, by assigning them new semantic values and new meaning. The resulting new knowledge space is, in most cases, completely uncharted and one has to start exploring it from scratch, grasping 'what it is about', its meaning, its possibilities, or its borders. From science it is a well known phenomenon that creating a completely new knowledge space always involves relatively high risk of failing or of being "falsified" (in the sense of, for instance, Popper, 1962). In the field of science this can be compared to Kuhn's (1970) scientific paradigmatic shift, such as in the Copernican Revolution: i.e., the shift from the geocentric to the heliocentric model which did not only change science but also had a deep impact on culture.

From the perspective of innovation and of the fascination by newness, radical innovations are more interesting because they challenge our thinking, our emotions, our perspectives on products, services, markets, and even on us. They *irritate*. They irritate, because we are both fascinated and fundamentally questioned in our patterns of thinking and perception.

This fascination and *irritation* has two sides: on the one hand, there is the "*thrill*" of being (intellectually) excited and surprised; one is surprised by discovering how narrow and limited one's own thinking and imagination are. On the other hand, this irritation may cause a state of rejection, refusal, uneasiness, or even fear, because our mind cannot find any category in which this radical innovation can be fit in somehow. Such innovations are simply missing any connection points (compare Luhmann's "Anschlußfähigkeit") and the capability to get into resonance with the user or with the organization. We are confronted with a real paradox and contradicting demands here. Hence, the challenge can be formulated as follows: Which strategy does one have to follow in order to create knowledge and innovations, which are *both radically new* and, yet—despite its radical nature—*fit organically into and get into resonance with the existing structures* of our thinking, organization, markets?

It is obvious that we are in urgent need of an alternative paradigm of knowledge creation here, as classic approaches neither in radical nor incremental innovation offer an adequate strategy for tackling this paradox.

Emergent Innovation

Radical Innovation Between Creativity, Wild Projections, and Waiting for "Kairos"

Profound innovation and sustainability. What are the characteristics of such a new type of innovation besides being *radically new* and, yet, *fitting organically* into current needs, situations, or in the natural flow of events? In contrast to many unsuccessful radical innovations that are the result of wild brainstorming, creativity techniques, and projections of one's own ideas and concepts, such a profound breakthrough in knowledge creation is both completely surprising and, at the same time, somehow has been anticipated (compare the notion of "kairos/ καιρός"[2]). It is as if it has been implicitly present all the time, but nobody has seen it, picked it up, and cultivated and developed it. The question of bringing about this kind of profoundly new knowledge is omnipresent in a wide range of domains, including science, business and innovation, individual cognition, or in evolutionary processes (Fontana, 2001). It is the question of *sustainable innovation*—innovation that is both profoundly new and at the same time naturally fits into the flow of nature, social processes, or technological dynamics. Such innovations are sustainable in the sense that they emerge out of the flow of

[2] "kairos/ καιρός" is a concept from ancient Greek referring to the right moment or being there and acting in the moment which is exactly opportune to achieve a certain change or goal.

things by *exploring* and cultivating latent qualities, which nobody has noticed or discovered yet. How can such types of new knowledge, insights, and innovations be brought about? Scharmer's (2007) Presencing approach provides the foundation for designing an innovation process fulfilling these qualities.

As a result of our research we have developed and empirically tested an approach to radical innovation aimed at bringing forth profoundly new knowledge and realizing it in concrete innovations titled *Emergent Innovation* (Peschl & Fundneider, 2008). "Profoundly new knowledge" means that this knowledge is both radically new (in the sense of a radical innovation) and yet respects what already exists; that is, it fits organically into the core of the innovation-object (be it a concrete object, social system, business-model, service, product, idea, phenomenon one is scientifically interested in, or cognitive domain) and its systemic environment. The theoretical foundation of this interdisciplinary socio-epistemological innovation technology/framework can be found in models of situated cognition (Clark, 2008; Menary, 2010), Scharmer's (2007) Theory U, dialogue (Bohm, 1996; Isaacs, 1999a), approaches in design (Glanville, 2007; Krippendorff, 2006, 2011) and reflective approaches from philosophy and other fields (Rodgers, 2002; Rogers, 2001; Schein, 1993).

This is not only a structured innovation process, but also a set of attitudes and values, which determine a specific epistemological framework, perspective, and atmosphere in which innovation takes place. These models have been developed further on a theoretical level and translated into an integrative, concrete, operational, as well as empirically tested innovation process, which we refer to as "LEAP". LEAP, making a "leap" into the uncharted domain of newness, is a generic innovation process, which has been successfully applied in several industries and can be scaled to various company sizes ranging from relatively small organizations with 15-20 employees to global companies with over 5000 employees (see below).

Principles of Emergent Innovation: Radical, Yet Organic Innovation from Within

Instead of having only a large number of bright ideas, we are proposing to focus on bringing forth the "right" ideas—they are "right" (in the sense of "kairos") and radically new at the same time. The concept of Emergent Innovation follows a fundamentally different approach: it is a *socio-epistemological technology* focusing on the cognitive and social processes leading to a new type and quality of innovation process.

Emergent Innovation as a collective socio-epistemological process of high quality knowledge creation. In most cases, innovations do not just appear by chance. A culture of openness, learning, creativity, and readiness for error must be fostered and rewarded in order to make innovation happen in an organization. On an individual level, this is typically dependent on the personal ability, traits, and commitment of a single person or a small group of interested individuals. On an organizational level, establishing this culture is primarily a leadership task (e.g., setting goals, setting examples, rewarding, enabling structures for free spaces, etc). Regardless of the many techniques available to stimulate innovations, most innovation processes are based on the classical process steps of: idea generation, idea selection, idea management, and implementation and realization of plans. In many cases the techniques being used in this process are brainstorming sessions emphasizing quantity of ideas and selection of ideas by stage-gate techniques (Cooper, 1990; Fagerberg, Mowery and Nelson, 2006). Most outcomes of such an approach are *incremental* innovations, as the basic thinking behind these processes does not go beyond Level 2 (see Figure 1).

Instead of focusing on these techniques and classic procedures of innovation management the approach of Emergent Innovation focuses on engaging the individual processes of cognition and perception using techniques including radical reflection, questioning, dialogue, deep observation, or presencing. Initially, these individual processes are practiced and acquired on an individual level. Subsequently, they are engaged at a collective level. The quality of most of these processes increases dramatically in speed and impact when they are done on a collective level or in groups with a high level of trust between its members (Webber, 2002; Costa, 2003).

In many cases radical innovations are tied to *single persons*, so-called "mavericks"—individuals who think outside the box, who are not mainstream, who are for whatever reason different. History shows, however, that most radical innovation initiatives fail on an organizational level (Dodgson & Gann, 2010). The reasons for this lie in the fact that these processes are highly dependent on single persons or a rather small group of individuals and on their involvement; hence, these innovation processes are standing on rather shaky and fluctuating ground.

One of the core ideas of *Emergent Innovation* is that it is not primarily dependent on exceptional individuals who are expected to create radical innovations, but rather several members of an organization are selected to acquire the understanding and skills in the basic thinking that underpins the processes of Levels IV and V in Figure 1. In some cases, radical

innovation and Emergent Innovation may lead to similar outcomes (e.g., an improved product, service, process, business model, or strategy). However, the processes having led to these results are completely different. On the one hand, a few outstanding individuals generate radically new knowledge on an occasional basis; on the other hand, a team of well-selected and trained members of an organization is responsible for a continuous flow of radical innovations, which are the result of a *systematic process*. In this sense, Emergent Innovation is not only an innovation technology, but also—and almost as importantly—a human resources initiative, both increasing and empowering the ability to conduct high quality innovation processes as well as introducing a completely new and organic culture of innovation into an organization.

Developing a profound understanding of the core as a prerequisite for Emergent Innovation. Classic methods for radical innovation are implicitly based on a number of assumptions, such as that they are completely "far out", or that it is necessary to develop a high quantity of "wild ideas" from which one has to make a selection (e.g., Fagerberg et al., 2006; Kelley, 2004; Schnetzler, 2005). These assumptions are challenged in the Emergent Innovation approach.

Contrary to generating a high quantity of low-quality ideas, the Emergent Innovation approach focuses on its innovation object in addition to its systemic environment. Innovations emerge out of a process of (i) profoundly studying and understanding the innovation-object and of (ii) reflecting and letting-go of predefined patterns of perception and thinking (see for example, Bohm, 1996; Depraz, Varela, & Vermersch, 2003; Isaacs, 1999a; Scharmer, 2007).

One must first achieve a profound understanding of the core of the innovation object, the organization, and its context before it is possible to explore its potentialities. By 'core' we are referring to the very essence, the heart, the very meaning, the substance of an organization, of a product, service, business model, or, more generally speaking, of any phenomenon. It is difficult intellectual and philosophical work to reveal this core. In most cases, it is hidden behind/beneath the features, characteristics, functions, and processes of the innovation object. Revealing the core involves excavating the most profound meaning and the core of a phenomenon by intellectually penetrating it, by observing it closely in a highly mindful manner, by asking deep questions and by trying to get as close as possible to the object of investigation both intellectually and physically. This is what metaphysics in its

classical philosophical (non-theological) conception is trying to do (e.g., Aristotle, 2007) as well.

Out of that total immersion results a deep unity with the innovation object or the phenomenon of interest; it resembles an "intimate relationship" between the object and its observer. This intimate relationship can be compared to 'deep insight/knowing' and profound understanding (which is similar to what one experiences when he/she has a 'eureka' experience). This exploration on the level of the core (i.e., beliefs and assumptions) might lead to insights, which are both completely new and at the same time fit into the existing contexts, as they are rooted in the core of the phenomenon and not in the imagination, projection, or wish of the observer. This leads to radical, yet 'organic innovations' in the sense of both respecting and developing and/or changing the core essence of the innovation-object.

The socio-epistemological technology of Emergent Innovation is a highly fragile and intellectually challenging process, which demands an attitude of openness, patience, reflection, and ability and readiness to leave behind one's own ides and expectations. Such a fragile process has to be held in a container, which we are referring to as an 'Enabling Space' (Peschl, 2007a; Peschl & Fundneider, 2011). An Enabling Space is a multi-dimensional space enabling and facilitating these processes of knowledge creation. This enabling space includes a physical, social, mental/cognitive, emotional, epistemological, as well as technological dimension and these dimensions are integrated within the knowledge creation processes.

Enabling Emergent Innovation: From potentia to actus—a new type of knowledge? What are the assumptions behind this approach to knowledge creation and innovation? This approach is based on the premise that there is something latent in reality or existing knowledge that wants to break forth. This is closely related to a very old concept from metaphysics, namely Aristotle's concept of "*potentia*" (δύναμς, potentiality) and "*actus*" (ἐνέργεια, actuality) (Aristotle, 2000, 2007; Cohen, 2009; Stein, 1986). "Potentia" means several things including potentiality, an aptitude to change, a possibility which is dormant in a phenomenon or object, to act or to be acted upon, something that might change, to give or to receive some new form or determination. We refer to this type of knowledge as "in potentia-knowledge". "Actus", on the other hand, can be translated as actuality and means the actualization, completion, or fulfillment of such a capacity. Therefore, potentia always refers to something in the future, which at present exists only as a germ to be developed or evolved; actus denotes a kind of completeness and the corresponding complete reality (a

realized causa finalis). In short, potentia can be understood as the determinable being, whereas actus denotes the determined being (Cohen, 2009).

Why are these concepts of interest for the context of Emergent Innovation? If we are interested in radical, yet organic and sustainable innovation we have to think about it in terms of something that is "in potentia", something that is not directly visible or obvious yet, which is hidden, but which is already there as a germ/potential. That is why it is necessary to be extremely open, attentive, and sensitive to this core of the phenomenon which one is interested in. There is something that wants to break forth, but that is highly fragile and too weak to break forth by itself in most cases. This is also closely related to what Scharmer refers to as *self-transcending knowledge* (Kaiser & Fordinal, 2010; Scharmer, 2001, 2007; Senge et al., 2004). Therefore, it is necessary to facilitate this process of shifting this object/phenomenon from being in a state of "in potentia" into being "in actu". This is what we refer to as *enabling*: facilitating the process of breaking forth new latent qualities and dynamics, facilitating to give birth to a new form, or new knowledge. Scharmer's *presencing* approach is closely related to this process of incubating and cultivating this fragile type of "in potentia-knowledge".

Comparing this process to traditional approaches to innovation and knowledge creation reveals that this goes far beyond classical "out-of-the-box thinking" or creative tools (see for example, Department of Trade and Industry (UK), 2005; Kelley, 2004).

"Innovation from within". The first phases of the process of Emergent Innovation focus on seeing, profoundly understanding, reflecting, and respecting what already exists. What already exists is seen as an opportunity rather than an obstacle. Instead of imposing external and/or inadequate patterns or "wild ideas" to the object of innovation, Emergent Innovation tries to respect and at the same time explore and develop the most radical and unforeseen potentialities of the core essence of what is already there. In other words, it explores the space of what is present in a latent manner and what wants to emerge. In this sense Emergent Innovation is a kind of 'radical innovation from within'. Innovation is not a new feature, which is somehow added or incorporated from the outside, but something that emerges intrinsically from the inside. There will always be some kind of "family resemblance" (Wittgenstein, 2001) although it seems to be radically new.

Thinking from the future and sensing what wants to emerge. Exploring this space of potentialities (i.e., in potentia-knowledge) implies that Emergent Innovation looks at

innovation as thinking from the perspective of future potentialities rather than of repeating, adapting, and extrapolating patterns from the past. The question "What wants to emerge?" is a clear pointer to the future and implicitly instructs the whole process of Emergent Innovation and knowledge creation. In Foerster's (2003), terms we could say that "…the cause lies in the future" (p. 230).

Why "Emergent" Innovation?

What is emergence in the context of innovation? In general, emergence means that a system displays qualities that cannot be found in its components; in other words:

> Emergent entities (properties or substances) 'arise' out of more fundamental entities and yet are 'novel' or 'irreducible' with respect to them. For example, it is sometimes said that consciousness is an emergent property of the brain. (O'Connor & Wong, 2009, p 1)

As such, features emerge out of the interaction of the system's components (on the micro-level) and appear as "new qualities" on the macro/collective level (see also Corning, 2002; Stephan, 1999, 2006)

The approach of Emergent Innovation takes this abovementioned phenomenon into account in the following ways: (i) Radically new knowledge is not primarily the result of analytic processes, but is understood as an emergent phenomenon; (ii) This new knowledge develops and emerges from within and much of what emerges is implicitly already present—the challenge is to explore the space of potentialities and enable the process of emergence; (iii) That is achieved by providing the appropriate set of constraints: as has been mentioned above, the emergent property of 'new knowledge' results from interaction between the subsystems of the knowledge creation system (e.g., between the cognitive systems) and the interaction with environmental structures which we refer to as constraints, because they provide a context of restrictions and interventions for the whole knowledge creation system. If these constraints are well orchestrated this might lead to an emerging phenomenon, such as the emergence of new knowledge; however, it does not determine it[3]; (iv) Finally, Emergent Innovation is a highly social process in which the collective dimension plays a crucial role.

[3] These concepts are also applied on the Enabling Spaces approach (Peschl, 2007b; Peschl & Fundneider, 2011).

New knowledge emerges out of the interaction between a group of individuals in a structured socio-epistemological process of interactions and constraints.

LEAP: Emergent Innovation in Action

After having taken a closer look at the theoretical foundations of the Emergent Innovation approach, we present the concrete innovation process in this section. Being the implementation of the principles and concepts of the Emergent Innovation approach we refer to this process as "LEAP", because the core of the process is centered around taking a leap into a more or less uncharted space offering the possibility to listen to what wants to emerge (see Scharmer, 2007, p. 13 and p. 39).

LEAP is organized as a series of workshops with coaching phases in between. Each workshop lasts about 1-3 days and the whole process duration is between 5 and 8 months. The team starts off either with a rough idea in which field they are expected to bring forth innovations, or with an open field. Each phase has a specific character and incorporates particular 'modes of knowing' (such as reflecting on assumptions and patterns of perception, sensing for potentials, prototyping learning cycles, or generative listening), which are mediated and supported by *Enabling Spaces*.

Phase 1 | Selecting an innovation team. Initially, an innovation team is formed using an interviewing technique referred to as in-depth interviewing or generative interviewing (see also Scharmer's (2007) levels and fields of conversation, p. 236 and p. 274). By that, a team is established that is capable of bringing forth and realizing radical innovations. Interestingly, during the interviewing process in many cases interviewees reach an insight by themselves as to whether or not they would be adequate members of the innovation team. This results from how we lead the interviewees through this generative conversation. It is not so much a classical interview in which we try to determine their cognitive, creative, or social skills. Rather, we are completely engaging with them and their issues concerning questions about innovation, the new, their private future, or the future of the organization; we follow the flow of the conversation which—in most cases—leads to the relevant insights whether or not an interviewee fits into the innovation team and, if yes, what his or her role could be in this team. This is already a first step towards an 'insight from within' which is an intrinsic property of the whole Emergent Innovation approach.

Phase 2 | Entering the Enabling Space. In this phase a common social space is created by establishing a high level of trust, removing prejudices, and forming a common

understanding of the process of Emergent Innovation. This is achieved by working on various common topics, by establishing a joint vision for the social structure of the team, by reflecting on assumptions and premises both concerning the innovation project and the social structure and coherence of the team itself, and finally by trying to negotiate and establish a common set of rules for the social interaction in the team. Most of this is done in a dialogic setting (e.g., Bohm, 1996; Isaacs, 1999a).

Phase 3 | Sensing the field—learning to see and becoming aware. Emergent innovation is not solely based on creativity techniques, but focuses on a profound understanding of and intense interaction with the subject matter and its context.

> The gateway into the field of sensing and co-sensing is total immersion in the particulars of the field—in the living presence of the phenomenon. It is becoming *one* with the phenomenon you study. It is *not* studying your customers. It is *not* creating dialogue with your customer. It is *becoming*, *being* your patient or customer. It is living in the full *experience* of that world—and becoming one with it. (Scharmer, 2007, p. 148)

One prerequisite for this "becoming one with reality" is the ability to see, perceive, and observe reality in its wholeness and in its very depth. This cognitive ability sometimes is referred to as "deep" or "primary knowing" (e.g., Rosch, 1999; Scharmer, 2007, pp. 32ff, 107, 167ff; Varela, Thompson, & Rosch, 1991); it needs both time and space for practicing and includes a variety of observational and perceptual techniques, specifically mindful observation (e.g., Depraz et al., 2003). In most cases one follows a rather classical analytical and (natural) sciences-oriented pattern of observation: one tries to verify/falsify a hypothesis and projects this hypothesis out to reality. By that, the perspective gets very limited and one will only observe what fits into the patterns of the hypotheses. The whole process results in analytical knowledge that is well-known from almost all fields of science or economy. By contrast, primary/deep knowledge, which is related to the notion of wisdom, is the result of an observation process which is conducted with a highly open mind, with high sensitivity, with empathy for reality and other humans, with respecting what is already present, with not wanting to "prove" or project something in the environment, but with wanting to be completely determined by the reality, the mind being ready to be 'deformed' by reality. These are cognitive abilities which most of us are not used to. That is why the team members have to receive basic training in mindful observation during the workshops.

Phase 4 | Reflecting and redirecting through topic centered dialogue. In this phase individual and collective patterns of perception and thought are questioned and broken up by explicating hidden assumptions in a dialogical setting (Bohm, 1996) and sharing these assumptions within the innovation team. These practices aim at getting to know the individual origins of thought, challenging them and thereby redirecting perceptions (Depraz et al., 2003) and the focus of attention.

From the perspective of shared assumptions a first common topic or theme is collectively negotiated using dialogue and applying a mapping technology. This theme then forms the semantic container for the whole innovation project or the 'emergent thematic field'. These processes happen both on a personal and group level. The resulting emergent thematic field is then presented to the sponsors of the innovation project and adjusted, if necessary.

Phase 5 | Experiencing potentialities and Presencing – Deep knowing and profound understanding. In preparation for this phase a comprehensive body of knowledge related to the selected emergent thematic field is collected from a variety of areas and sources (e.g., data from learning journeys, interviews, research, or observations). The purpose of this exploration is to develop a deep knowing and profound understanding of the innovation object (i.e., the emergent thematic field), a prerequisite for the process of *Presencing*.

In this phase the participants let go of everything in order to enter the empty space of potentialities as unbiased as possible. In this space the challenge is to connect and come into resonance with the core of oneself, the core of the thematic field, and of the organization (i.e., its purpose and the theme in a larger context). This happens most likely if the participants allow themselves sufficient space for silence and inner quietude. The atmosphere is relaxed and at the same time everybody is fully concentrated in order to reach the openness for dealing with substantial questions and topics; this supports the process of perceiving and exploring the space of potentialities. From this process deep insights about the future emerge which present themselves—although with a high degree of fragility—with great certainty and a high level of inner and outer coherence.

This special level of certainty evolves from the inside out and is based on the openness for and from listening to "the future as it emerges" (Scharmer, 2007, p. 52). The knowledge that arises in such a process has the quality of fundamentally new insights and at

the same time creates innovations that seem to have grown organically from what already exists.

Experience from a wide variety of innovation processes and innovation teams shows that this phase is highly successful, especially if it takes place in a retreat like environment such as nature. Case studies have shown (see for example, Scharmer, 2007) that such a setting is optimal for the sensitive work of intuitive knowledge creation.

Phase 6 | Crystallizing and Cultivating- Emergent design. As the knowledge gained in the process of presencing has a high level of fragility, it has to be incubated. In this phase, the insights of all the participants are shared and combined into common scenarios. This is achieved using dialogical techniques, mood-boards, storyboards, and practices from design-thinking (Brown, 2008, 2009; Glanville, 2007; Sanders & Stappers, 2008). Through this process an emergent design evolves and crystallizes. This is the vision, which is not only shared among the members of the innovation team, but also with innovation project sponsors and with the other employees in the organization. From that point in time the process opens itself up to the rest of the organization and starts to actively communicate about the innovation project.

Phase 7 | Prototyping – Fast cycle learning through immediate realization. The emergent designs are condensed and form the basis for concrete development plans and prototypes. Such models and functional scenarios allow fast learning through rapid feedback-loops and openness for mistakes (Kelley, 2004; Laurel, 2003). The aim of this phase is to develop the prototypes to a level of maturity that allows the existing processes and structures of the organization to assimilate them.

Phase 8 | Embodying – Putting things into practice in an organizational setting. In the final stage, the tested prototypes and models are integrated into the established business processes and routines of the organization.

Learning from the LEAP Process: Experiences and Results

In this section we discuss some key findings from applying the LEAP process in a relatively large number of cases. Furthermore, LEAP has proven to be a generic innovation process, which has been successfully applied in several industries and settings; it has been applied and tested in more than 25 cases in various contexts, including: media companies, environmental consulting companies, software developers, technology developers, global

automotive component producers, IT-companies, banking context, as well as in various educational settings (e.g., PhD seminars for thematic search, designing enabling spaces, and designing innovation processes).

Key Findings

The most interesting findings can be summarized as follows: apart from the conceptually interesting insights concerning how new knowledge comes into the world in a completely different mode than we are used to, there was one significant response: On a personal level most members of the innovation teams reported that they have gone through a process of profound change in their own thinking and attitudes toward the world (or in some cases even to their partner). This is not so surprising, because Theory U is designed as a rather profound personal change process. Nevertheless, we have been surprised how deep and profound this change was experienced by most of the team members.

On a collective level it has turned out that, due to the profound change on a personal level, the innovation teams became extremely strong and intense. A strong social coherence emerged which lasted much longer than the actual innovation process. These innovation teams were not only remarkable from a social perspective, but also from their collective intellectual and social capabilities in jointly reflecting, dialoguing, designing scenarios, and prototyping.

Another significant finding out of these processes is that, from the perspective of the participants, the actual innovations that have been brought forth were not as important as their personal and group learning and the positive impact of this learning, including improved relationships with their colleagues, fostering a culture of innovation, and increased openness and reflective capacity. It was surprising how deeply involved the team members were in these processes and that they went out 'with a mission'. Apart from creating an innovation, going through this LEAP process was a HR-activity with high impact on a personal as well as collective level. The team members and the organization benefited both from the theoretical application of LEAP as well as the practical skills developed in the process. These skills and attitudes spread through most departments of the organization.

From a content perspective it was interesting that most innovation projects were situated in a rather conceptual domain (i.e., the creation of new organizational forms, structures, and processes, of an innovation space, concerning the architectural design of the office, or concerning the question of the organization's business model). Looking back at this

process this is not surprising: the whole process of Emergent Innovation has a strong focus on the "core" of the innovation domain, of the organization, or of the innovation object. Hence, the concepts resulting from this innovation process are concerned with more profound questions or phenomena—they will go far beyond incremental innovations; they will be rather abstract and on a higher and more general level, such as questioning and 'reinventing' the whole business model of an organization. However, if the initial conditions given by the client are more strict and more focused on concrete questions this tendency towards high level and general results can be reduced.

Discussion, Conclusions, and Outlook

Emergent Innovation as a socio-Epistemological Technology for Sustainable Knowledge Creation

Besides the aspect of sustainable knowledge creation, Emergent Innovation has to be seen as a socio-epistemological technology. What does that mean?

Social—the collaborative dimension. Every innovation process is intrinsically embedded in social processes for several reasons: each of us is living in a socially constructed world forming the background and matrix through and in which we perceive and think (Glasersfeld, 1995). Hence, these social patterns of thinking, which express themselves as cultural, scientific, and artistic artifacts or paradigms, are always the basis for any process of innovation. Generating new meaning in the form of innovation(s) only makes sense if one takes into account the background of the collective setting of socially constructed meaning and intentions.

From an innovation perspective, the social context is extremely important when it comes to, for instance, reflecting on one's premises, negotiating and exploring the core of an innovation object/phenomenon, or realizing and testing innovations, such as in the process of prototyping (Kelley, 2004; Moggridge, Suri, & Bray, 2007). If prototyping takes place in a collective setting, the quality and speed of verifying and adapting the prototype increases dramatically, because the members of the team bring in many different perspectives, which 'epistemologically collide' with the concrete prototype. Furthermore, as we have seen above, modern innovation processes are no longer limited to a single 'maverick', they are intrinsically based on teamwork and social interaction—the world, technology, and social conditions have become far too complex to merit the individual approach to innovation.

Epistemological—the knowledge dimension. Epistemology, as a sub-discipline of philosophy, is concerned with the question of knowledge, how it comes into being, and how it changes (Churchland, 1979). Innovation involves several highly complex knowledge processes, such as knowledge acquisition, negotiating meaning, constructing relationships, reflecting, and breaking up implicit assumptions, entering into the uncharted space of new knowledge, engaging intuitions, creating new knowledge, dealing with highly fragile "in potentia-knowledge", transforming knowledge into concrete realities or prototypes, adapting knowledge, fast cycle learning, and many more. These knowledge processes are engaged both on an individual and collective level.

It is important to consider that these knowledge processes have to be applied in a highly systematized and reflective manner in order to successfully bring forth innovations. For each phase of the innovation process both the designer of the innovation process and the innovation team have to be very clear about which kind of knowledge is involved in a particular phase. Otherwise, the whole enterprise of innovation degenerates into a game of gambling (Drucker, 1985). For each type of knowledge particular environments and socio-epistemological tools are necessary. That is where technology comes in.

Technology—the dimension of processes, methods, and tools. Following Arthur, we "will define a technology… quite simply as a means to fulfill a human purpose... A technology is built around the reliable exploitation of some effect, as envisaged through some principle of use" (p. 276). In that sense, technology is a rather well-defined and structured practice, process, or procedure which itself might involve other technologies. Philosophically speaking, technology plays the role of a tool, a means, or an instrument in order to achieve some desired state or goal. It does so by mediating between cognitive activities, such as planning or realizing some internal model and the object (in the outer world) by making use of some effect.

Putting things together

What does that imply for our understanding of Emergent Innovation as socio-epistemological technology? The concept of innovation cannot be limited to mere knowledge processes or to waiting until some brilliant idea emerges somewhere and at some unexpected moment. Rather, the whole facilitating context of innovation has to be taken into account. In that sense, Emergent Innovation is a form of tool-mediated social practice creating new knowledge and new realities as is suggested by Cole and Derry (2005):

> The study of technology must focus on behavior and artifacts in the context of activities…. Our emphasis on technologies as forms of tool-mediated social practices also inclines us to adopt a broader notion of intelligence than that adopted in most contemporary theorizing on the subject. (p. 211)

It is necessary to provide structures that can facilitate these highly fragile and complex knowledge processes, such as Enabling Spaces (Peschl, 2007a; Peschl & Fundneider, 2011; Peschl & Wiltschnig, 2008).

Emergent Innovation and Scharmer's Theory U

Understanding Emergent Innovation as an *enabling space* implies that this kind of innovation becomes a highly structured and systematic process, which nevertheless provides enough space that newness can break forth. In the first phase of the process of Emergent Innovation there is a strong focus on the cognitive and epistemological processes being involved in this kind of innovation work; namely, learning to observe, reflect, discover, and understand one's own hidden assumptions and patterns of perception and thinking, and becoming competent in systematically exploring, changing, and letting-go of these assumptions. Furthermore, the persons involved have to acquire new attitudes and values both on an individual and collective level: attitudes of openness, being aware and mindful, humbleness, patience, and readiness to question one´s assumptions. These activities correspond closely to the phases in the left side of Scharmer´s (2007) Theory U model (see also Figure 1).

In the second phase—we are going through the "bottom of the U" now—the innovation team enters into an empty, however sparsely structured space in order to explore the field of hidden latent qualities. This is done in a structured process of exposing oneself, for instance, to nature and quietness. During this stage the prepared mind has to be cleared in order to open up the mental space for the new and unexpected. One has to 'listen to what wants to emerge' and to the still-concealed and quietly-emerging potentialities of the core. This is the heart both of the process of Emergent Innovation and Theory U: it is the place of "connecting with the source of inner knowing" (Scharmer, 2007, p. 40, 164ff). The resulting insights are fragile and have to be cultivated in the process of crystallizing. The third phase follows the classical forms of project development which is mainly driven by prototyping and implementing.

Experience has shown that these processes do not take place in an abstract or arbitrary space. On the contrary, it is necessary to (i) provide a very well prepared environment in the sense of an Enabling Space (Peschl & Fundneider, 2012). This especially applies to the process of going through the 'bottom of the U'. Providing such enabling structures implies a sophisticated design of processes, time, and physical, social, as well as epistemological space. (ii) Secondly, the participants have to be internally prepared and ready to go through such a process of profound change and of being exposed to themselves and the emerging field of new insights. The knowledge emerging out of this process is highly fragile and has to be cultivated and nurtured into an emergent design. This is done during the third phase in a process of crystallizing, which leads to an emergent design. This is the basis for a series of prototypes in which the innovation team learns in fast-cycle trial-and-error learning processes. Finally, the resulting findings and experiences as well as the newly developed organizational and cultural changes get realized in a fine-tuned implementation process. This is accompanied by a continuous communication and monitoring strategy.

The results of several innovation projects indicate that this socio-epistemological technology can be applied in a wide field of contexts, industries, and sciences. Sustainable futures can be created that both 'surprise' by their game changing character and respect, as well as organically fit into what is already there in the organization, in science, in the market, in society, and culture by bringing them to a next level of development.

Key Insights: The following are key insights that we have found to be crucial to the application of Emergent Innovation:

- If the goal—both in Emergent Innovation and in Theory U—is to bring about profoundly new and sustainable knowledge or innovation, one has to focus on the processes of cognition, perception, and reflection as well as on developing them through radical reflection, questioning, dialogue, and deep observation on an individual and organizational level.
- Instead of producing a large quantity of ideas with relatively low quality (which have to go through a selection process), the focus has to shift towards a profound and holistic understanding of the object/phenomenon of innovation, its context, its potential users, as well as its stakeholders. Seeing, profoundly understanding and respecting what is already in place is an opportunity rather than an obstacle for innovation. In this sense innovation involves *"surfing reality*": This is a metaphor for picking up the already existing dynamics in the core and the potential of the

innovation object for bringing forth the new, rather than fighting reality and trying to impose our own dynamics by forcing changes which do not really fit.

- If something new comes up, we have to be prepared to understand its potentiality and to act quickly and in a determined manner. This can only be achieved by a continuous state of alertness and attentiveness.
- Both Theory U and Emergent Innovation involve a '*school of humbleness'*: We have to learn to be silent, to wait, and to listen, to get 'in-/deformed' by reality instead of wildly and disrespectfully projecting and throwing our own ideas and concepts into the world. We have to give up on forcing change and pushing to bring forth newness. In many cases it is necessary to take some time of doing nothing and listen to what wants to come forth instead of forcing some pseudo innovative activity. Of course, this 'doing nothing' is far from being only passive. It is a state of being highly attentive to reality and to interact with it in a very mindful manner.
- Innovation must be understood in terms of *future potentialities* instead of repeating and extrapolating patterns from the past.
- *Organic radical innovation from within*: The focus is on the process of emergence of innovation from within and towards enabling this process as opposed to imposing or forcing it. This means respecting and at the same time cultivating and developing the most radical and unforeseen potentialities of the (profound understanding of the) core/essence of what is already there. This implies that—despite its (radical) newness—the innovation is always connected with its core and, thus, organically fits into what has been there already, although it might look radically different. In its very core it is connected with the original concept whose potential has been cultivated. In this sense Emergent Innovation is a kind of *innovation from within*.

Both the Emergent Innovation approach and Theory U represent a genuine framework which can be used in a wide field of applications, such as: the educational setting, innovation work, settings of knowledge co-creation and developing joint visions, integration of intellectual knowledge work and personal development, conference settings, knowledge creation in interdisciplinary scientific theory development.

As has been stated above, innovation is not limited to a product or service, but includes all possible processes, social innovations, discourses, or cultural change. Such an understanding has its roots in Krippendorff's "ecology of artifacts" ranging from objects via interfaces to discourses (Krippendorff, 2006, 2011). Both Theory U and the Emergent

Innovation approach provide a framework that fits such an understanding of innovation very well, because both focus on the roots of phenomena and how they can be developed and cultivated further.

Future Research and Next Steps in Research

Epistemological Foundations

At the moment we are investigating epistemological aspects of Emergent Innovation in terms of the kinds of knowledge and knowledge dynamics that are involved in these processes. It seems that we need some kind of alternative epistemological framework, which takes into account these emerging aspects of knowledge, for example, a more in-depth investigation of "in potentia-knowledge", or as Scharmer (2001) puts it, of self-transcending knowledge. There still has to be done a lot of work in understanding what these highly fragile knowledge processes of "listening to the future as it emerges" (Scharmer, 2007), of deep-knowing, or what "in-potentia-knowledge" really imply. It seems that we are missing an "epistemology of profound innovation" here.

Spaces enabling Emergent Innovation

Another important branch of our research concerns the development of *Enabling Spaces*. We are searching for spaces enabling these kinds of processes mentioned above and knowledge creation processes in general. By space we are not only referring to an Euclidean or architectural space, but also to the social, emotional, cognitive, technological, cultural, and epistemological dimensions of such spaces (Peschl, 2007a; Peschl & Fundneider, 2011; Peschl & Wiltschnig, 2008). These spaces have to be thought of as a set of constraints, which do not determine or control knowledge creation processes, but *enable* or facilitate them. The interesting and at the same time challenging part of this research and design work is to find such interdisciplinary constellations and configurations in these dimensions which facilitate these highly fragile knowledge processes as we know them from the Presencing approach.

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