

# “Creating Sustainable Futures by Innovation from within”: Radical Change is in Demand of Radical Innovation

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## Abstract

We are currently in a crisis (e.g. climate change, the breakdown of the financial system, species extinction, worldwide poverty, etc.). Some claim this a ‘crisis of crisis’. Others refer to the current state as a ‘systemic crisis’ and the momentum of a great bifurcation. This raises the question whether or not we will have the opportunity of choice to change at the very moment of the bifurcation. Are we able to provide an innovation design that does not only address the problems but that enables involved stakeholders to anticipate their interconnected sustainable futures? We argue that prevailing innovation design approaches have fundamental shortcomings. We suggest to rethink and redesign – not to re-engineer – these innovation processes, if we want to address effectiveness rather than efficiency, radical and at the same time profound and sustainable innovation rather than incremental innovation.

## 1 Introduction

The breakdown of the financial system, climate change, species extinction, worldwide poverty and starvation, upraising conflicts on water and natural resources, etc. suggest that we are currently in the midst of a crisis [Taylor, 2008; Korten, 2009]; some claim this even a ‘crisis of crisis’. Others refer to the current state as a ‘systemic crisis’ and the momentum of a great bifurcation [Hofkirchner, 2007].

The problem or questions remaining are: Will we have the opportunity of choice and change at the very

moment of the bifurcation? Will we have the capacities to serve the need of sustainable and livable solutions? Are we able to provide an innovation design that does not only address the problems but that enables involved stakeholders to anticipate their interconnected sustainable futures? We suggest to rethink and redesign our approaches towards innovation, not re-engineering these processes, if we want to address effectiveness rather than efficiency, radical innovation rather than incremental innovation. Therefore we believe that – pathetically speaking – we are in need of a radical change of approaches and attitudes as otherwise we might miss the one opportunity of choice at the very moment of the bifurcation.

## 2 Research Scope

In this paper we argue that prevailing innovation and design processes have shortcomings and do not allow to meet the demands and needs of stakeholders, although those procedures are claimed *participatory design* or *open innovation*; they are based on the implicit assumption that consumers play a crucial role in the innovation and design process. Although a widely used and respected approach on a microlevel for short-term research and development, we argue that another approach is needed on a more global scale. In the next section we discuss these prevailing theories and approaches from participatory design with open innovation and identify their deficits. This discussion will serve as foundation of our argument, i.e. the need for *radical innovation* in a specific sense. We discuss how profoundly new knowledge, that is both radically new and yet respects what is already there, can fit organically into current desires and situations and how these kinds of innovation and change can be brought about. One perspective towards that approach is represented

by LEAP, an empirical proven innovation process design, that originates from the concepts of emergent innovation, design thinking, as well as informal systemic concepts.

### 3 The Trend Towards Participatory Design with Open Innovation

In this section we evaluate current trends in participative innovation process designs that promise an increase in innovativeness, creativity, resolving hierarchies, and opening up borders. Some authors envision even the emergence of a “collective intelligence” [Lévy, 1997]. Contrary, we argue that the promise of stakeholder participation or involvement and collective intelligence roots in the industrial management paradigm of strategic competitive advantage. General aims of innovation projects aim at four objectives, namely creating a niche or new market demands in an already saturated market place, cutting costs, reducing the time to market and gaining market share and dominance in the long run. See for example Kim and Mauborgne [2005], Porter [1985], Hamel and Prahalad [1994], and Ansoff [1965] for a deeper discussion.

#### 3.1 The Promise of Participatory Design

Open innovation promises achievements in all of the four above-mentioned objectives, even more efficiently, because current and future consumers are already involved in the design processes. The design process addresses a shift of the structures outside the boundaries of the organization and therefore an externalization of costs (to the customers) and risk reduction as the primary purpose [Reichenwald and Piller, 2006; Kuhn and Hellingrath, 2002]. The inherent creation of consumer or brand communities strengthens the marketing intensions to gain and defend market shares furthermore. Second to this analysis we argue that open innovation is a risky design approach, because, although it promises to foster the *wisdom of the crowds*, it may enable the “dumbness” of the masses.

In recent years, traditional, hierarchical innovation and design has become more open, e.g. by opening up the borders of companies, universities, research institutes, etc. and integrating stakeholders in the design process. Such approaches emphasize on opening up innovation processes, because “valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well” [Chesbrough, 2006].

#### 3.2 Stakeholders in Innovation

Stakeholders can be integrated during the diverse productions steps, i.e. participatory design [Schuler and Namioka, 1993; Bora and Hausendorf, 2006], and open innovation [Chesbrough, 2006; Drossou *et al.*, 2006]. These approaches assume, that integrating users and potential consumers in design and production have a positive impact. Eason [1988] for example argued already twenty years ago that the “design of effective socio-technical systems will depend upon the participation of all relevant stakeholders in the design pro-

cess” . Quarcoo [2000] points out that one must ensure to involve all stakeholders in the process of planning, designing, and executing. Including *all* stakeholders, i.e. groups or individuals who are affected by or are “in some way accountable for the outcome of an undertaking” [Hood *et al.*, 2007], however would make design and innovation processes way to complex and practically impossible. Meeting the demands of *all* potential stakeholders suggests to give voice to everyone who could become a customer or user. This causes the risk of increasing complexity, where groups become too large to handle and outcomes are more unpredictable. If, on the other hand, less stakeholders are integrated, one risks to cause *blind spots* or to miss certain customers’ demands. Thus, first, *relevant* stakeholders have to be identified. Second, one has to decide at which production stage they should be integrated and third, which role they could play and thus how much impact or power their decisions have.

#### 3.3 Stakeholder Integration During the Production Process

Innovation, in particular *sustainable innovation* requires “a clear identification, analysis, and classification of stakeholders” [Steiner, 2008]. Many approaches discuss the integration of stakeholders in the process of innovation, development and implementation. Accordingly, we can distinguish between methods where stakeholders are either originators of products and thus involved from the very beginning, or during the process<sup>1</sup>. Most commonly we find methods where stakeholders become important after a product is already produced or at least prototyped and potential consumers serve as evaluators (or ‘beta-testers’). Stakeholder integration often takes place without actually involving stakeholders as Steiner [2008] argues in an earlier issue of *Cybernetics and Systems*.

#### 3.4 The Problem of Timing

Similar to the problem of *who* should be considered a relevant stakeholder is the question of *when* to integrate him or her. If stakeholders participate too early it becomes more difficult to reach certain goals, since a variety of possibilities can occur. If they are integrated too late, certain developments might be deadlocked and it becomes more difficult to turn things around. Participation of stakeholders or potential consumers thus is not an ethical goal of such an innovation approach. Participatory design methods have the potential to give consumers what they currently desire. But the shared paradigm today seems not to intend the participation of all stakeholders in the design of products, processes, and business models. Such an innovation approach would consider the interdependences and interconnectedness of social, biological, and physical systems as stakeholders. Even more such designs

<sup>1</sup>e.g. user innovation [von Hippel, 2005; Piller, 2006], collective invention [Allen, 1983; Osterloh *et al.*, 2006], commons-based peer production [Benkler, 2005; 2006], collaborative innovation networks [Gloor, 2006], wikinomics [Tapscott and Williams, 2006], crowd sourcing [Howe, 2008], and many more.

would recognize the innovating organization itself as a stakeholder of the wider system. Economy itself and each and every business model depend on social and environmental liveability and sustainability. But nowadays it still depends on those actors who are in the position of power to decide who will be considered a relevant social group (target group) and who will become an evaluator or recognized stakeholder.

### 3.5 The Pitfall of Stakeholder Integration

Identifying certain people and defining them as *relevant stakeholders* that share common problems and to include them in the design process, necessarily means to exclude other people - either consciously or unconsciously. Some groups of people are marginalized for particular reasons, e.g. because they are overseen, thus unconsciously excluded, or ignored, i.e. consciously excluded. Certain groups of people might be consciously excluded, because integrating them in the design process bears risks, for example that these stakeholders will shape the design of the product in other ways than initially intended or planned (this might cause additional, unexpected costs), or because these stakeholders would deny to use certain products. Therefore, participation of stakeholders has to take place in controlled settings and thus is rather realized as a 'laboratory experiment' [Bogner, 2009], exerted and organized from experts, than a real bottom-up innovation process. Such participatory design approaches may lead to a marginalization of alternative ideas or solutions because of group dynamics and modes of selection of relevant social groups. Alternative viewpoints are often ignored or overlooked. Participatory methods organized by professionals thus often lead to mainstreaming of opinions and users demands. Participatory design methods, executed by so-called 'participation professionals' [Bogner, 2009] therefore have to be considered as a top-down process, where alternative ideas rarely have a chance to become acknowledged. Ideas become marginalized - as become groups and possible solutions. Mainstreaming fosters the hype of average results and a standardization of ideas. Very often a potentially emerging collective intelligence leads to dumbness of the masses rather than to a 'wisdom of the crowds' [Surowiecki, 2004]. Such thinking leads to 'more of the same' and incremental innovations rather than to radical rethinking of innovation processes.

### 3.6 The Problems of Participatory Design

Although legitimate from a rather short-term focused micro-economics perspective we argue that these above-mentioned approaches aim merely at serving the demands arising from the short-term economic logic of cost cutting in research and development and marketing, to decrease innovation and proto-typing costs, and misses the long term purpose of the livability and sustainability of the system including the organization itself within the larger system of its environments. Long-term views are theoretically avail-

able, but are not yet realized in practice. We believe that a long-term perspective is needed in order to meet the challenges arising from practice, i.e. to be able to cope with challenges and problems such as global crisis. In the next section we provide a perspective towards one solution that promises to enable an organization to gain a systems perspective and anticipate the futures that emerge, leading to radical innovation and profound change. The origins of such approaches favor the participation of the actors within the whole, getting a part of the system rather than observing the object of desire as an excluded subject. Such approaches also emphasize the conscious role and responsibilities of the decision makers in the innovation design. They are rooted in the assumption that deep understanding and conscious involvement will not only lead to breakthrough but also to ethically and responsible solutions; as those who decide and act get aware of their own interconnectedness as humans in the web of life.

## 4 Emergent Innovation and Ontological Sustainability

This section presents a newly developed and empirically tested approach to game-changing innovation aiming at bringing forth *profoundly new knowledge and realizing it in concrete innovations: Emergent Innovation* [Peschl and Fundneider, 2008].

### 4.1 Profoundly New Knowledge Bridging the Gap between the Unknown and the Known

One of the key problems for radical innovation lies in bridging the gap between the following two poles: (i) bringing forth something which is both really radically new and game changing and (ii) - at the same time - can be somehow related and connected to existing knowledge, experiences, products, services, etc. (i.e., the question of "Anschlussfähigkeit"). That is, what the concept of profoundly new knowledge is about: it is (new) knowledge that is both radically new (in the sense of a radical innovation) and yet respects what is already there. I.e., it stems organically from the core of the innovation-object (be it a business [model], service, product, idea, organization, etc.) and its systemic environment.

### 4.2 Ontological Sustainability

As will be shown below, these profound innovations have the quality of being *ontologically sustainable* in the following sense: due to the fact that they evolve out of the *ontological core* of the innovation-object they are a 'natural', yet radically new, development of qualities which have been present in an undiscovered, yet latent manner. The theoretical foundation of this interdisciplinary socio-epistemological innovation technology/framework can be found in models of (situated) cognition, C. O. Scharmer's Theory-U [2007], designing systems [Banathy, 1997], dialogic and reflective approaches (e.g. [Bohm, 1996; Isaacs, 1999]), etc.

This kind of innovation emerges out of a process of (i) a profound understanding of the innovation-object and (ii) reflecting and letting-go of predefined patterns of perception and thinking (compare also U-Theory [Scharmer, 2007]). This leads to radical, yet “organic innovations” in the sense of both respecting and developing/changing the core/essence of the innovation-object (be it an aspect of society, business, service, product, idea, etc.). This socio-epistemological technology of emergent innovation is a highly fragile and intellectually challenging process which has to be held in a container which we are referring to as enabling space [Peschl and Wiltschnig, 2008]; it is a multi-dimensional space enabling and facilitating these processes of knowledge creation. This enabling space comprises of a physical, social (trust, etc.), mental/cognitive, epistemological, as well as technological dimension.

These models have been developed further on a theoretical level (*Emergent Innovation*) and translated into an integrative, concrete, operational, as well as empirically tested innovation process which we refer to as “LEAP”.

### 4.3 LEAP: Realizing Profound Sustainable Innovation

The LEAP process, which lasts four to eight months, is organized in seven phases in the form of workshops that are referred to as Learning to see, Dialogue on innovation fields, Experiencing potentialities, Emergent design, Prototyping, etc. In addition to the individual workshops, the selected participants of the innovation team are also assisted in dealing with various organizational issues concerning the realization of the innovation project (in innovation coaching sessions); e.g. communication strategy, management approval, small-scale partial implementation and adjustment the existing corporate structures and processes. The LEAP process also serves as a tool for personnel development within the innovation team.

The first phase of LEAP is mainly concerned with developing a profound understanding of the core of the innovation-object and with discovering and reflecting hidden assumptions. By entering a space of emptiness one tries to let-go of these assumptions and well-trained and predefined patterns of perception and thinking. The goal of this process is to discover and explore hidden latent qualities of the core of the innovation-object (plus its environment/systemic context).

This kind of *innovation emerges through* a process of both profoundly understanding the core of the innovation-object, reflecting, and letting-go of predefined patterns of perception and thinking by entering a space of *emptiness*. In a first step, the goal of this process is to discover and explore *hidden latent qualities of the core* of the innovation-object (plus its environment/systemic context). In a second step these latent qualities of the core are converted into potentialities which – in a third step – are realized in a concrete innovation project (emergent project designs, prototypes, implementation inside and outside of an organization).

Hence, we differentiate between latent qualities of the core and potentialities: Whereas the latent qualities of the core are concealed and extremely difficult to identify (they actively have to be carved out), potentialities are already at least in their vague shape *visible*; they are undeveloped future possibilities/perspectives which are readily waiting for being developed.

The demanding task is to identify these latent qualities, as they are extremely fragile on the one hand they are concealed, on the other hand they “want to break forth” in many cases. That is why this approach is referred to as *Emergent Innovation from within*. The resulting innovations are *ontologically sustainable* as they are the result of a process facilitating the dynamics of bringing forth and of breaking through of *what wants to emerge* from the ontological core of the innovation-object anyway. The difficulties involved in this approach are manifold: to fight one’s way through to the core of the innovation-object, achieve a profound understanding of the core, to develop the awareness, identify, and gain an insight of the latent qualities hidden in the core, and to be able to *listen to what wants to emerge* out these latent qualities. These are cognitively as well as epistemologically demanding tasks which have to be accomplished both individually and collectively by the members of the innovation team. Hence, in the first phase of the LEAP-process there is a strong focus on the cognitive and epistemological processes being involved in this kind of innovation work; namely, learning to see/observe, to reflect, to discover and understand one’s own (hidden) assumptions and patterns of perception and thinking, becoming competent in systematically exploring, changing, and letting-go of them. Such precise observation and close attention requires an atmosphere, in which distraction through ones own thoughts and organization is reduced and one is open only for the (absolute) new. This is achieved by practicing e.g. observation, attention, learning journeys, generative interviews, questioning, etc.

In the second phase the innovation team enters into an empty, however sparsely structured space in order to explore the future potentialities sustained by a container of previously identified (hidden) latent qualities. This is done in a structured process of exposing oneself, for instance, to nature and quietness. The knowledge emerging out of this process is highly fragile and has to be cultivated and nurtured into an emergent design. The third phase of LEAP translates this emergent design into prototypes which are the basis for fast-cycle trial-and-error learning processes for the innovation team. Finally, the resulting findings and experiences as well as the newly developed organizational and cultural changes get realized in fine-tuned implementation process which is accompanied by a continuous communication and leadership strategy.

Several innovation projects have proven that this socio-epistemological technology can be applied in a wide field of economic, educational, social, scientific, etc. contexts. Organizations successfully implementing the LEAP-process were different in sizes (15 – 500 employees), had various organizational forms (co-op,

public limited, research institution) and operate in diverse industries, such as media, water management and data visualization. Still, there are many points to be developed and refined in this project. By following the strategy of Emergent Innovation, *ontologically sustainable futures* can be created which both *surprise* by their game changing character and respect as well as organically fit into what is already there in the organization, market, in society, and culture by bringing them to a next level of development.

## 5 Conclusion

Such design and the resulting innovations as we propose promise life affirming solutions and stewardship of living assets, serving and inspiring people as well as serving nature as the driving business purpose. Profitability and growth for life [Bragdon, 2006] as well as real wealth creation relating to happiness and long-term well-being of people [Korten, 2009], is therefore the next innovation and design challenge we have to meet. Our consumer society cannot be transformed into a conserver society [Taylor, 2008] without radical innovation and profound game-changing change.

## References

- [Allen, 1983] Robert C. Allen. Collective invention. *Journal of Economic Behaviour and Organisation*, 4(1):1–24, 1983.
- [Ansoff, 1965] H. I. Ansoff. *Corporate Strategy*. New York: McGraw-Hill, 1965.
- [Banathy, 1997] Bela H. Banathy. *Designing social systems in a changing world*. Springer, 1997.
- [Benkler, 2005] Yochai Benkler. *CODE: Collaborative Ownership and the Digital Economy*, chapter Coase’s penguin, or, Linux and the nature of the firm, pages 169–206. MIT Press: Cambridge, MA, 2005.
- [Benkler, 2006] Yochai Benkler. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven and London, 2006.
- [Bogner, 2009] Alexander Bogner. Partizipation als laborexperiment. deliberationsverfahren im zeitalter der technowissenschaften. conference contribution (unpublished). 2009.
- [Bohm, 1996] David Bohm. *On Dialogue*. Routledge: London, New York, 1996.
- [Bora and Hausendorf, 2006] Alfons Bora and Heiko Hausendorf. Participatory science governance revisited: Normative expectations versus empirical evidence. *Science and Public Policy*, 33(7):478–488, 2006.
- [Bragdon, 2006] Joseph H. Bragdon. *Profit for Life. How Capitalism Excels*. Society for Organizational Learning: Cambridge, MA., 2006.
- [Chesbrough, 2006] Henry William Chesbrough. *Open Innovation: The new imperative for creating and profiting from technology*. Harvard Business School Press, 2006.
- [Drossou *et al.*, 2006] Olga Drossou, Stefan Krempl, and Andreas Poltermann. *Die wunderbare Wissensvermehrung: Wie Open Innovation unsere Welt revolutioniert*. Heise Verlag: Hannover, Heidelberg, 2006. Kopie.
- [Eason, 1988] Ken Eason. *Information Technology and Organisational Change*. Taylor & Francis: Philadelphia, PA., 1988.
- [Gloor, 2006] Peter Gloor. *Swarm Creativity. Competitive Advantage Through Collaborative Innovation Networks*. Oxford University Press: Oxford, 2006.
- [Hamel and Prahalad, 1994] G. Hamel and C.K. Prahalad. *Competing for the Future*. Harvard Business School Press, Boston, MA, 1994.
- [Hofkirchner, 2007] Wolfgang Hofkirchner. A critical social systems view of the internet. *Philosophy of the Social Sciences*, 37(4):471–500, 2007.
- [Hood *et al.*, 2007] Colin Hood, Simon Wiedemann, Stefan Fichtinger, and Urte Pautz. *Requirements Management. The Interface Between Requirements Development and All Other Systems Engineering Processes*. Springer: Berlin Heidelberg, 2007.
- [Howe, 2008] Jeff Howe. *Crowdsourcing. Why the Power of the Crowd is Driving the Future of Business*. Crown Business Publishing. New York, 2008.
- [Isaacs, 1999] William N. Isaacs. *Dialogue and the Art of Thinking Together: A Pioneering Approach to Communicating in Business and Life*. Doubleday Currency: New York, 1999.
- [Kim and Mauborgne, 2005] W.C. Kim and R. Mauborgne. *Der Blaue Ozean als Strategie. Wie man neue Maerkte schafft, wo es keine Konkurrenz gibt*. München: Hanser Wirtschaft., 2005.
- [Korten, 2009] David S. Korten. *Agenda for a New Economy. From Phantom Wealth to Real Wealth*. Berrett-Koehler Publ., Inc.: San Francisco, Ca, 2009.
- [Kuhn and Hellingrath, 2002] Axel Kuhn and Bernd Hellingrath. *Supply Chain Management. Optimierte Zusammenarbeit in der Wertschöpfungskette*. Springer: Berlin, 2002.
- [Lévy, 1997] Pierre Lévy. *Collective Intelligence. Mankind’s Emerging World in Cyberspace*. Perseus Books, 1997.
- [Osterloh *et al.*, 2006] Margit Osterloh, Sandra Rota, and Roger Lüthi. *Die wunderbare Wissensvermehrung. Wie Open Innovation unsere Welt revolutioniert.*, chapter Collective Invention’ als neues Innovationsmodell?, pages 65–76. Heise Verlag: Hannover, 2006.
- [Peschl and Fundneider, 2008] Markus F. Peschl and Thomas Fundneider. *The Open Knowledge Society: A Computer Science.*, chapter Emergent Innovation and Sustainable Knowledge Co-creation.

- A Socio-Epistemological Approach to “Innovation from within”., pages 101–108. Springer (CCIS 19): New York, Berlin, Heidelberg., lytras, miltiadis d. and carroll, john m. and damiani, ernesto and tenyson, robert d. and avison, david and vossen, gottfried and ordonez de pablos, patricia edition, 2008.
- [Peschl and Wiltschnig, 2008] Markus F. Peschl and S. Wiltschnig. Emergent innovation and enabling spaces. spaces enabling processes of knowledge creation. In U. et al. Lucke, editor, *DeLFI 2008 und Cognitive Design 2008. Proceedings der Tagungen Mensch Computer 2008*, pages 446–451. Berlin: Logos, 2008.
- [Piller, 2006] Frank T. Piller. *Die wunderbare Wissensvermehrung. Wie Open Innovation unsere Welt revolutioniert*, chapter User Innovation. Der Kunde kann’s besser, pages 85 – 97. Heise Verlag: Hannover, 2006.
- [Porter, 1985] M.E. Porter. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press, 1985.
- [Quarcoo, 2000] Philip K. Quarcoo. *Science and Technology Policy in Africa*, chapter Macroeconomic Policy Analysis, Management and Planning vis-à-vis Science and Technology Policy in Africa, pages 39 – 49. Africa World Press: Trenton, NJ, 2000.
- [Reichenwald and Piller, 2006] Ralf Reichenwald and Frank T. Piller. *Interaktive Wertschöpfung. Open Innovation, Individualisierung und neue Formen der Arbeitsteilung*. Gabler: Wiesbaden, 2006.
- [Scharmer, 2007] Otto C. Scharmer. *Theory U. Leading from the future as it emerges. The social technology of presencing. Society for Organizational Learning*. MIT Press: Cambridge, MA, 2007.
- [Schuler and Namioka, 1993] Douglas Schuler and Aki Namioka. *Participatory Design: Principles and Practices*, Lawrence Erlbaum Associate. 1993.
- [Steiner, 2008] Gerald Steiner. *Cybernetics and Systems 2008*, chapter Stakeholders Matter: How Stakeholders can Contribute to Sustainable Innovation, pages 313 –318. 2008.
- [Surowiecki, 2004] James Surowiecki. *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*. Doubleday (Random House Inc.): New York, 2004.
- [Tapscott and Williams, 2006] Don Tapscott and Anthony D. Williams. *Wikinomics: How Mass Collaboration Changes Everything*. BT, New York, 2006.
- [Taylor, 2008] Graeme Taylor. *Evolution’s Edge: The Coming Collapse and Transformation of our World*. New Society Publishers; Gabriola Island., 2008.
- [von Hippel, 2005] Eric von Hippel. *Democratizing Innovation*. MIT Press: Cambridge, MA, 2005.