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# Theory-U: From potentials and co-becoming to bringing forth emergent innovation and shaping a thriving future

## On what it means to “learn from the future as it emerges”

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### Abstract

Facing our complex (global) challenges in a rapidly changing, unpredictable, and uncertain world begs the question of how we can bring about innovations that have a reasonable and sustainable purpose and that shape and lead to thriving and novel futures.

The claim of this paper is that, in order to bring forth such purposeful innovations and novelty, it is necessary to turn things on their head: instead of learning from the past and extrapolating past knowledge/experiences into the future, we have to start from the future. In this context Scharmer’s Theory U plays an important role as one of its main claims is to understand change and innovation as “Learning from the future as it emerges.” (Scharmer 2007, p 52)

The goal of this paper is (i) to develop an alternative approach to innovation that is driven by future potentials. (ii) By doing so, we will develop an epistemological/ontological framework providing a theoretical foundation both for Theory U and, as we refer to it, for Emergent Innovation. Bloch’s “not yet”, Aristotle’s potentials (vs. actuality), S.Kauffman’s “adjacent possibles”, Ingold’s “correspondence”, as well as Scharmer’s “Source” and “Higher Purpose” play a central role in this approach.

We will show that innovation is not so much dependent on the (creative) activity of an agent/innovator. Rather, we suggest to turn things on their head: if we want to shape an unfolding reality in an open-ended and purposeful manner, we have to acknowledge that we have to give up epistemic control and have to engage in an emergent process of co-becoming and co-creation with future potentials. We have to learn how to listen to, identify,

and cultivate the emergent purpose/final cause and that it will "pull" us towards a sustainable innovation.

In the last part of this paper we will discuss practical implications for organizations, skills and mindsets, Theory U, as well as for innovation strategies.

“Every human being is not one but two. One is the person who we have become through the journey of the past. The other one is the dormant being of the future we could become through our forward journey. Who we become will depend on the choices we make and the actions we take now. That being of the future is our highest or best future possibility... The essence of presencing is to get these two selves, these two beings, to talk and listen to each other, to resonate, both individually and collectively.” (Scharmer 2007, p 401)

## Introduction—context and challenges

How can we bring about new and thriving futures facing complex (global) challenges in a rapidly changing, unpredictable, and uncertain world? This is one of the most pressing questions of today’s knowledge economy and society in which innovation and (disruptive) change have become one of the key drivers for social, economic, educational, cultural, as well as technological dynamics. The more the focus is on creating novelty, in particular on creating novelty that brings forth *sustainable change* and *thriving innovations*, the more we are tempted to search for recipes or mechanisms that generate new knowledge by applying or following rules or well-proven methods/procedures.

Taking a closer look reveals however that such an approach is doomed to failure. For reasons of formal logic, rules or algorithms cannot generate radically new knowledge, as, by definition, they rely on past knowledge and only make explicit what is already implicitly given in these rules/algorithms. Innovation *cannot* be “made” or predicted by adapting or extrapolating past experiences, knowledge, innovations, or technologies into the future. And even if we apply highly creative methods or “out-of-the-box” thinking, that is no guarantee that the resulting “creative” solutions or so-called radical innovations will be sustainable or will lead to a thriving future (compare the innovation paradox; Peschl & Fundneider (2017)). We refer to such an alternative form of innovation as *future-driven/-oriented innovation* (as opposed to innovation that is primarily driven by the (extrapolation of the) past; cf. Peschl et al. 2015).

The claim of this paper is that—in order to bring forth sustainable and purposeful innovations and novelty—it is necessary to turn things on their head: instead of learning from

the past (e.g., Kolb 1984, Scharmer and Kaeufer 2010) and extrapolating past knowledge/experiences into the future, we have to start from the future. In this context Scharmer's *Theory U* (Scharmer 2007/2016) plays an important role as one of its main claims is to understand change and innovation as "*Learning from the future as it emerges*." (Scharmer 2007, p 52)

Although Scharmer's Theory U had a huge impact in a wide variety of domains (organizational, political, personal, social, coaching, etc.) over the last decade(s), there has been little further research on its theoretical foundations with respect to philosophical and epistemological issues. By questioning classical mechanistic and Newtonian approaches of innovation and prediction, this paper focuses on the question of what is exactly meant by "*Learning from the future as it emerges*" in the context of future-driven innovation and proposes an alternative framework providing a theoretical foundation for this question.

This paper is organized as follows: For the first step we will take a closer look at the situation which we find ourselves in when we try to innovate in a future-oriented manner. We will see that we are at the interface between past, present, and future, and that we are always confronted with an open-ended unfolding future that is "not yet" (Bloch 1975, 1986). The challenge is to come up with innovation artifacts that are "not yet", that want to emerge. In this context Aristotle's concepts of form and matter and how matter receives its form (i.e., the production of an artifact) turn out to be central. As an illustration and metaphor, we will develop what we refer to as "Innovation Zipper" depicting this situation of entering the space of an unknown future.

In the second step we will introduce the concept of adjacent possibles as a theoretical foundation and starting point for identifying and exploring future potentials. It turns out that they are compatible with what Aristotle (1991a) refers to as potentiality and actuality. We will relate these concepts to Scharmer's "learning from the future as it emerges" which can be reformulated as bringing potentials into actuality. One of the main requirements and challenges for achieving this is to give up epistemological control: i.e., will have to leave behind a hylomorphic approach to innovation and discover the importance of emergent purpose or final cause in such processes. In the final sections we will discuss the implications for such an approach to future-oriented innovation.

## The becoming and unfolding of reality as being in a state of "not yet"

Before entering into the emerging future, let's have a closer look at the situation we are confronted with whenever we are innovating or initiating change processes. In fact, this is the situation, in which we find ourselves in every moment of our being. "Like the world, human life is a venture, a series of risks, that is radically open to an indefinite future without

a certain conclusion.” (Kellner 1976, p 22) Following E.Bloch’s (1975) idea of the world being an “experiment” (“Experimentum mundi”), one can see that the world in general, our being as humans as well as organizations are in a constant process of becoming and unfolding over time. They are in an unfinished and incomplete state and process of “not yet”. We do not know (exactly) where this unfolding is leading to; due to this open-endedness we have just a rough idea about its (current) determination or finality at best (as it might change over time as well). As a consequence, future states of reality are categorically open (Poli 2006, p 77) meaning that the process of unfolding brings to light novel qualities, phenomena, categories, behavioral patterns, new determinations (in the sense of Aristotle’s (1991, 1991a) *causa formalis/finalis*) etc. that have been present only in a hidden and/or latent manner; they have “not yet” been perceivable or realized. They are potentials waiting to be developed or triggered either by internal activities, maturation processes, by external triggers, or environmental events.

## At the interface between past, present, and future: ontological considerations on the role of matter, form, and potentials

### On the “Not yet”

What is this “not yet” about? How is it related to and what is the role of potentials or “latents” (e.g. Poli 2011) in this context? What do we mean by talking about a human, an organization, or reality unfolding or becoming? How are these issues related to innovation, profound change, presencing (Scharmer 2007), and shaping the future? In order to find an answer to these questions we suggest to take a look at E.Bloch’s philosophical considerations in the first step. Although being rooted in a political and Marxist tradition, his concepts reveal a lot about our approach and understanding of innovation and future-orientedness as it is suggested by Scharmer’s Theory U (2007/2016). One of Bloch’s (1975, 1986) starting points is his observation that the past illuminates the present and that this may lead us into a (better) future. As is shown by Kellner and O’Hara (1976) in their discussion on Bloch, the present is characterized by *latency* and *tendency*. These concepts can be described as “the unrealized potentialities that are latent in the present, and the signs and foreshadowings that indicate the tendency of the direction and movement of the present into the future.” (Kellner and O’Hara 1976, p 16) In other words, our actual present world, our human existence, or an organization is in a permanent state of potentiality, of needs, and desires. It is waiting to unfold into something that is “not yet here”; the present state is the unrealized potential and it is our task to bring what-is-not-yet-realized (or the not-yet-come-into-being [“noch-nicht-Gewordenes”]) into the world by changing or transforming both the world and ourselves in accordance with what could be, with what could lead into a thriving future.

From that perspective, any existing reality (meaning the world, an object, a phenomenon, our human existence, or an organization) is *always more than it is in the current moment*, it surpasses itself and—in a way—is “*ahead of itself*” by being driven by its potentials, by what is yet to come, by the “not yet”, and by its surrounding influences. “Being ahead of itself” can be seen in a temporal sense as well as in the sense of final and/or formal cause. Such a dynamic is the very foundation for any process of bringing forth novelty, change, or innovation. In the context of humans and living as well as social systems in general, it is rooted in the process of life itself and its intrinsic dynamics and drive to thrive and grow and to bring to live what is “not yet”.

How can we characterize this “not yet”, how does it come into being? First of all, is important to note that novelty, innovation, or change always realizes itself in *material artifacts*, which we refer to as *innovation artifacts* (see later sections for details). In general, an artifact is an object that has been intentionally made or produced for a specific purpose (Risto 2011). In other words, there has to be one or more “authors” or agents (cognitive systems) who are responsible for having brought forth this artifact. Conceptually speaking, Aristotle (1991, 1991a) suggests that an artifact or an object is constituted as a *unity or compound of form and matter*. Form (formal cause/causa formalis) gives matter (material cause/causa materialis) its determination, its “meaning”, its purpose, its intelligibility, its “*what it is*”. As will be discussed (and challenged) later every (innovation) artifact, but also all natural objects, have a material basis that has or receives a specific form. In the case of artifacts, this form has its roots in a cognitive system’s knowledge: simply speaking, knowledge (form) or a “(new) idea” in a cognitive system’s mind is transformed into action/behavior itself shaping matter (i.e., artifacts, environmental structures) according to this knowledge or idea. In other words, form “in-forms” and is engraved into matter and this unity of form and matter constitutes an object or (innovation) artifact. It is, for instance, the artist and his/her idea or knowledge (i.e., formal cause) bringing form to bronze (matter/material cause) and, by this artistic activity (efficient cause), shapes a statue (concrete object).

This perspective is referred to as the *hylomorphic* framework/approach and has been discussed (as well as put into question) widely in various fields (e.g., Ainsworth 2016; Ingold 2013). The basic idea is that a specific piece of matter (an object) qua matter has a potentiality to be (in-) formed, to receive a specific shape or form, functionality, meaning, etc. through the intentional activity of an agent (e.g., a designer, artist, entrepreneur, or innovator). The resulting artifact **embodies** the original idea or knowledge of its creator(s). There is, however, a challenging question hidden in the hylomorphic approach that is especially interesting in the context of (future-oriented) innovation, organizational design, and Theory U: If matter is in a state of potentiality, it may receive a whole range of

different forms, determinations, meanings, etc. Which strategies do we have to employ so that the resulting artifact leads to interaction patterns that are truly beneficial for its user(s) and supports his/her purposeful thriving? What has been described as “form in-forms matter” above can be seen as a process of “*actualizing*” matter, bringing it from a state of (more or less pure) potentiality into a (more or less) determined state of being a specific object (see below for a more detailed discussion on potentiality and actuality) with a specific functionality and meaning. In most cases, this will be realized as a process of *transforming* existing (less/differently determined) objects into new objects, e.g., by reshaping, combining, connecting, etc. them. In other words, matter receives a (new) form, it is trans-formed into something different/novel, something that we refer to as (innovation) *artifact*.

For the context of innovation processes this implies that we are responsible for bringing (novel) form and final cause/purpose to matter by realizing its future potentials (i.e., realizing its “not yet”). Hence, the *becoming of reality* can be understood as a process of disclosing its potentials in a process of (self- and/or external) actualization: i.e., bringing the “not yet (known/realized)” into an actually existing state. In this context Bloch’s (1986, e.g. chapter 17) concepts of “Front” and “Novum” are important: *Front* is the foremost segment of time, where what is next is determined. In the following section we will see that this is an important state, as it opens up the space of possible successor states. “*Novum* is the real possibility of the not-yet-known, not-yet-wrought-into-being, with the accent of the good novum (the realm of freedom), when the trend toward it has been activated.” (Kellner and O’Hara 1976, p 32) This also implies that matter *cannot* be transformed in a completely arbitrary manner. The more or less loosely coupled existing compound of matter and form (to be changed/transformed) always imposes some *constraints* and *resistance* on its transformability. Whenever one is doing art or science, this is a well known experience: one is confronted with exactly this resistance emanating from reality, for instance, in the process of falsification in scientific experiments (e.g., Popper 1959) or failing to shape a lump of clay according to one’s ideas and plans. As we will see, this is an important insight for any innovation and change process as, in most cases, they are highly constrained by internal and external factors.

Although being rather abstract, one can see that there is a deep connection between these theoretical considerations above and Scharmer’s (2007/2016) Theory U/Presencing framework (see below for further details). They provide a sound philosophical/ontological foundation for the processes and dynamics taking place in the course of Presencing; the latter is exactly about identifying future potentials that “want to emerge”, that want to break forth, and that (hopefully) shape future states of the environment in a beneficial and thriving manner as they have been intrinsically present in the “not yet”. Understanding this approach as being grounded in an Aristotelian (1991a, 981b28) sense of metaphysics, we are dealing

here with looking at things from the rather abstract perspective of wisdom, first causes, and principles. However, as we will see below, these concepts have crucial implications and applications in almost every (practical) domain ranging from humans, over the realm of natural objects and phenomena, artifacts, social systems, organizations, to future-oriented innovation processes (Peschl and Fundneider 2017, 2017a). In the final section we will discuss some of these implications in more detail.

### Zipper metaphor: (Shaping the) “Becoming of reality”

In order to illustrate the situation we are in whenever we are producing, making (in the sense of Ingold 2013), or designing something, or creating an innovation (having been described above) in a more comprehensible way, I suggest to make use of the metaphor of a zipper<sup>1</sup> (see Figure 1). From a system’s science perspective (e.g., Kauffman 1993, 2000; Senge 1990; Weinberg 2011), the current state of reality and of a cognitive system is the result of its respective and joint history of transformations and interactions between the environment and a cognitive system at any moment in time. These interactions manifest themselves as transformations or reshaping of matter and as giving or changing the form (and sometimes meaning and/or final cause) of the material objects at hand (see discussion in the section above). Actually, the present point in time is the very moment where things are “put together”, transformed, re-shaped, combined, etc. by the behavioral activities and interactions of a cognitive system with the environmental dynamics and the internal dynamics of the object.

As a result of these processes, a (novel) artifact emerges in the course of time. Metaphorically speaking, in the moment, when the two parts of the zipper are conjoined a new artifact is created or emerges. As we will see below, we refer to this artifact as a (new) Actual (e.g., Kauffman 2014). Over time they form a specific “path” or they leave a “trace” of interaction and transformation patterns which we refer to as the “past” or history of interactions (compare also the concept of path dependency; e.g., Stack and Gartland 2003). An artifact represents such a (historical) trace that results from behavioral interactions between a cognitive system and its environment (see the “zipped path” in Figure 1).

Assuming a different perspective that takes into account the development over time, this metaphor describes the process of reality *unfolding* over time. What we are looking at is the process of *becoming* as it has been discussed in various contexts (e.g., in organizational theory, systems science, or in the theory of artifacts; e.g., Clegg et al. 2005; Cooper 2006; Ingold 2013, 2014; Kauffman 2014; Tsoukas and Chia 2002). In the following sections, we will discuss what “becoming” means and how we can study and shape it in diverse contexts.

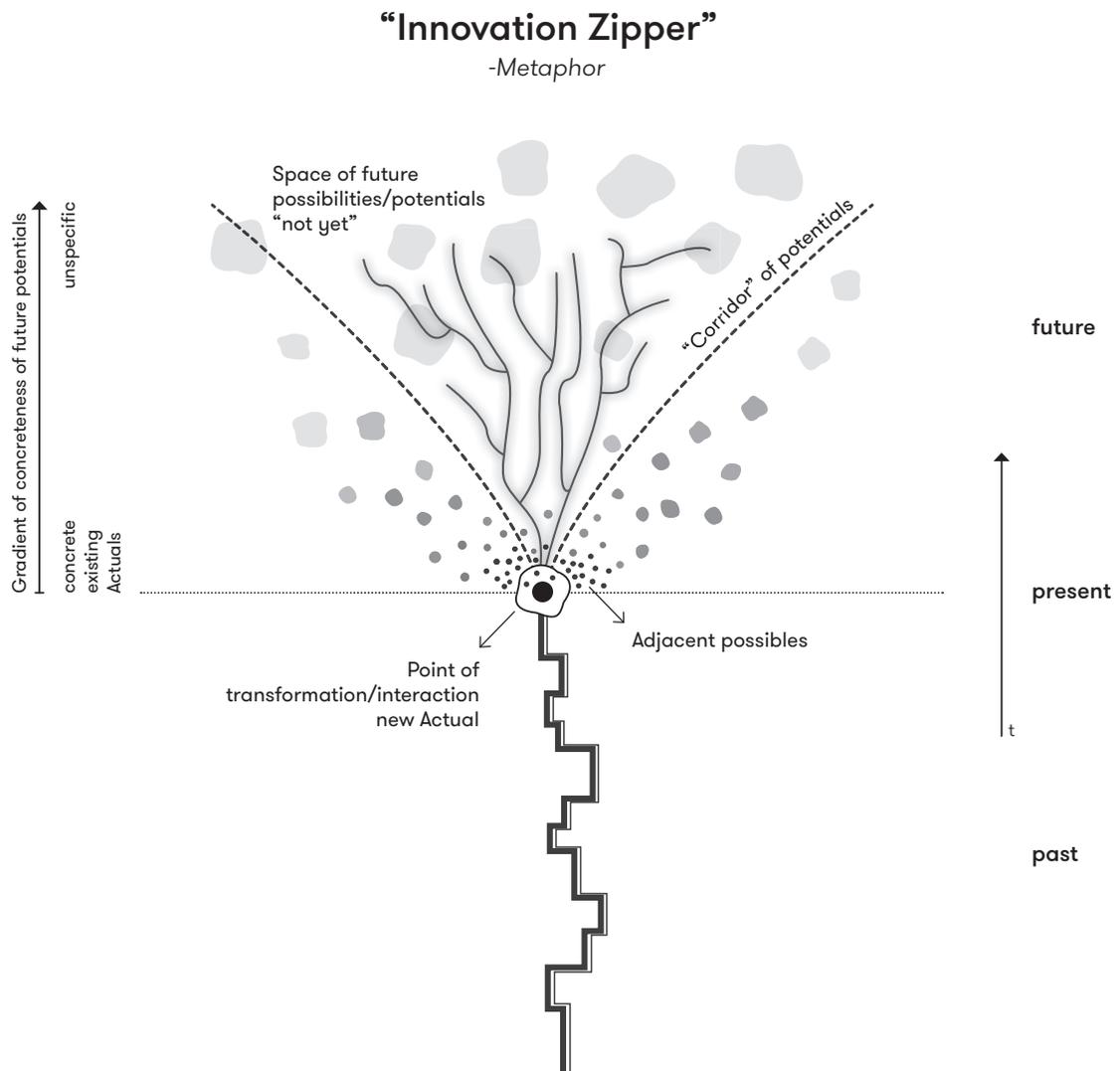


Figure 1: “Innovation-Zipper” metaphor: Moving from the past via Actuals and adjacent possibles to future potentials/Possibles. Becoming and shaping of reality and artifacts in a process of future-driven innovation.

What can we learn from the “zipper metaphor” from an innovation and Theory U perspective?

1. The present point in time and state/situation is the point of getting in contact with *potentiality* and the interface between the past and the future (see discussion above and below).

2. The present state is (partly) the result of the past: I.e., the present state is the product of an interaction- and transformation-history from the past. The “zipper-path” has emerged with each interaction/transformation decision and activity at each point in time. As a consequence, for creating (sensible) novelty and future-driven innovation it is critical to take the history of the Actual into consideration. Otherwise, any created future state becomes completely arbitrary.
3. The Future is neither completely deterministic nor completely open (at least for the mid-range future). For Theory U this implies that it is one of the challenges to identify a good balance on the polarity between openness and a deterministic perspective. In a way, it is paradoxically: with respect to a current state, future potentials are partly determined by the current state (itself being partly the result of its history) and at the same time they have capacity to develop in an open-ended manner (ideally towards its “(highest) Self/highest possible future”) (Scharmer 2007, p 41f, 401f).
4. An Actual being in a certain state/situation in the present implies that there is only a limited space of future possibilities and possible development paths into the future (“potentials”). At each point in time we have only a limited number of possible decisions/activities of how we might interact with the environment and/or how we might transform it. In other words, the space of potentials opens up a kind of “corridor” that is constrained by boundaries. For Theory U this implies that the future state will not only lie within the boundaries of the corridor, but, above that, has to relate to the “(highest) Self/highest possible future” (e.g., Scharmer 2007, p 41f, 401f); hence, it is necessary to identify a path leading to such a desired thriving future state. We are going to discuss this rather crucial issue in the section(s) to come.
5. Gradient of concreteness from the present to the future: The further potentials lie in the future, the more fuzzy and unspecific they become. Potentials lying in the near future are more concrete. The situation at the present point in time comprises concrete (material) realized elements (“Actuals”) that may be used by the creator/cognitive system(s) as building blocks for shaping the next instantiation of the artifact in an (creative) act of transformation. As will be shown in the next section, the totality of next possible instantiations forms the space of “adjacent possibles” (Kauffman 2000, 2014).
6. In most cases—for economical reasons—not all future possibilities will necessarily be explored and become expressed.
7. Open question: if we have some understanding of the space of future possibilities, which path should we choose at a specific point in time, how, and why?

The final points direct our attention toward an important issue that is highly relevant both for Theory U and our initial question of how to bring about innovations that are future-driven, that serve a (higher) purpose, and that are sustainable, as well as contribute to shaping a thriving future. In the subsequent sections we will develop these ideas as well as this zipper metaphor further with respect to these questions.

## Becoming: From adjacent possibles to Actuals

As an illustration of the above situation (being inspired by Kauffman 2000) think about the situation of a child (or innovator) building a complex object from Lego bricks: By starting with one brick you attach another brick to it and, step by step, you end up with a more or less complex object having a specific shape, meaning, purpose, and functionality. This object is the result of subsequent steps of transformations. In this context it is important to introduce the notion of the *adjacent possible*: “The adjacent possible is just that set of unique novel objects, not yet constructed, that can be constructed from the current set of Lego objects in a single construction step. Of course, within the limited world of Lego we can think of the technologically adjacent possible from any actual. A Lego economy might flow persistently from simple primitive objects into the adjacent possible, building up evermore complex objects.” (Kauffman 2000, p 224)

Returning to our zipper metaphor above, the adjacent possible describes the situation we are in when we are transforming an existing artifact/Actual by, for instance, combining or extending it with other existing objects into a new Actual. As a result, these newly created Actuals might offer a new use, purpose, or meaning. If we are interested in future-oriented innovation aiming at bringing forth profound novelty (and not just incremental adaptations or extensions of existing systems or objects), the processes having been described above cannot be executed in a purely mechanistic manner. In other words, we have to *question the classical mechanistic worldview* (as well as the state of consciousness and the mindset standing behind this view); in most cases, such a classical approach is based on Newton’s laws expressing what *actually is* happening in the world (and not what *potentially could* happen; see also Kauffman 2000, 2014; Felin et al. 2014; Koppl et al. 2014; Longo and Montevil 2013). One of these laws’ premises is that the dynamics or becoming of the material world can be expressed by entailing laws in a more or less deterministic and mechanistic manner (e.g., by calculating predictions from a formula or rule system in a deductive manner). Such a worldview reduces reality to Aristotle’s efficient (and material) cause.

However, in his *Metaphysics* (V 2) and *Physics* (II 3) Aristotle (1991, 1991a) (and in large parts of philosophy) develops the idea that, if we want to understand and explain reality in a *comprehensive* manner, we have to take into account and search for four causes:

material, efficient, formal, and final cause. In the efficient (and material) cause perspective (in most cases assumed by the natural sciences) the world is (a) reduced to its material aspects and (b) is described by entailing laws or rules (e.g., in the form of differential equations). This results in a mechanistic understanding of the world, because applying these laws (for instance in predictions) only covers and makes explicit what *actually is* (and *will be*) and what is already implicitly given in the structure of the laws or rules. As an implication, we can neither expect a lot of novelty or creativity arising from them; nor can we hope for insights about potentials or what *could be possible*. However, this limitation is contradictory to our experience of a world that is characterized by a high level of richness, creativity, uncertainty, and unpredictability.

As a consequence, for understanding and designing/shaping a world that is heavily driven by socio-technological dynamics, knowledge economics, and innovation we do not only have to take into consideration materially based cause-effect relationships/laws, but also the domains of *meaning*, *purpose/use*, and *goals* (i.e., formal and final cause). Being open to the emergence of novelty, of new functions, or of new purposes and meaning implies that we have to surpass the realm of a mechanistic and deterministic perspective on systems and on their unfolding and becoming. We have to introduce a shift from Actuals/actuality to Possibles/possibility. The question we are facing in the context of future-oriented innovation as well as in Scharmer's (2007) Theory U is: How do entirely novel Actuals with new meaning, purposes, or uses arise (that cannot only be derived from the mechanistic laws of physics)?

Following Kauffman (2000, 2014) let's take a look at living systems and their evolution in the biosphere in order to achieve a better understanding of the challenges in the context of future-oriented innovation. Evolutionary dynamics unceasingly brings forth (sometimes radical) novelty; it is not predictable and not describable by entailing laws (Longo et al. 2012). Kauffman (2014) introduces the differentiation between *Actuals* and *Possibles*: Actuals "define the existing and not merely potential or possible (p 3)... Actuals and Probables obey the law of the excluded middle, Possibles do not... I have proposed a new dualism, *Res potentia*, ontologically real possibles (that do not obey the law of the excluded middle) and *Res extensa*, ontologically real Actuals (that do obey the law of the excluded middle) (p 6)" Kauffman 2014, p 3 & 6)<sup>2</sup> The fascinating thing about Possibles is that they can be both ontologically real, they may physically materialize, and at the same time their functionality or purposefulness resists prediction, they are "*unprestatable*" (Kauffman 2000, 2014; Longo et al. 2012).

In other words, final cause and/or formal cause *cannot* be predicted (Kauffman uses the term *unprestability* in this context); they emerge as a result of the interaction between the new Actual and its environment in the moment of transformation. Additionally, we have to

be aware that—in most cases—the complexity increases, as the environment itself changes with the emergence of the new Actual and, therefore, the space of possible interactions (implying new functionalities, uses, and purposes) changes and increases as well. Hence, we can conclude the following: yes, we can predict all possible material configurations with high accuracy by making use of entailing laws (Aristotle’s efficient and material cause), for example, from Newtonian physics or by computing all possible combinations of, for instance, Lego bricks. However, it is *not* possible to prestate/predict (all) its purposes, uses, or meanings (i.e., final and formal cause). For finding answers to these questions we have to go beyond classical deductive rules and laws and develop an alternative framework. As we will see, such a framework is rooted in Aristotle’s potentials, in Bloch’s “not yet”, and in the concept of Possibles having been developed above. Furthermore, we will show that they are the theoretical foundation for what is happening in Scharmer’s (2007) presencing.

The original question we are addressing in this paper is how to bring forth an innovation (artifact) having a reasonable and sustainable purpose and use in an emergent process of co-becoming and co-creation (with a creative agent)? Although Kauffman (2014) argues from an evolutionary perspective, we can derive several interesting learnings from this account for the context of innovation and Theory U:

1. The current state of an innovation artifact (= Actual) plus its surrounding objects (= the “zipping situation”) are constraining the next step of transformation.
2. However, this transformation does not happen in a mechanistic manner; rather, the “zipping situation” acts as an *enabler for adjacent possible opportunities* that can not be fully predicted in their functionality or purpose.
3. New Actuals (embodying unpredictable and new purposes and functionalities) arise from this process in a radically **emergent** manner.
4. They act as a new starting point for the next step in the transformation process. New Actuals *enable* (but do *not* entail) new (adjacent) possibles.
5. In a sense, this process is recursive/self-referential as it *shapes and produces its own future environment in which the subsequent steps of this process* will happen.
6. However, these recursive dynamics do not necessarily imply a limitation concerning the scope of opportunities, but rather an opening up to new spaces of possibles and opportunities that are appearing in the process of transformation. Actuals create new adjacent possibles enabling the emergence of new Actuals which in turn enable new adjacent possibles...

## Enabling and Creating New Niches

Pushing this idea of creating one's own environment that functions recursively as a new point of departure for the next step of the subsequent transformation creation processes one step further leads us to two related concepts. They are important both in the domain of evolution and (future-oriented) innovation: the phenomenon of *preadaptation* and the creation of an (*empty*) *niche* (e.g., Felin et al. 2014; Kauffman 1993, 2014; Longo and Montevil 2013). Each newly created Actual constitutes a set of boundary conditions functioning as *enabling constraints* by establishing a space of potentials/adjacent possibles in which new Actuals may emerge. In evolutionary terms this new Actual embodies an (yet) *empty niche*. It is empty, because its potential use (or purpose) is not (yet) known, does not yet serve a particular purpose/use, and might become essential at a later point in time.

This novel use might emerge in a later step of transformation when both the environment and/or the artifact and the user are "ready" (in the sense of "considering it useful") to make mutual use of these newly created structures. In other words, the (empty) niche gets filled with a useful, sensible, purposeful, and/or thriving interaction pattern (e.g., between a user and the newly emerged innovation artifact). In Darwinian terms, such an empty niche can be understood as a *preadaptation*; an adaptation that does not yet have any (or a different) use in the present moment. It opens up a space of (yet unknown) opportunities that might become useful at a later point in time. However, at the present point in time we do not have (a good or) any understanding of the possible future use(s) that might eventually emerge in subsequent transformation steps. This is an intrinsically *creative* process that does not follow a specific plan or goal from the outset. It is unprestatable; metaphorically speaking, we do not know the next possible use of a screwdriver. The (next) use, purpose, or meaning *emerges* in this process of creating niches providing a new enabling environment that gives rise to and creates yet new niches... that, at some later point, makes these pre-adaptations useful (without selection processes explicitly or "intentionally creating" them). We propose to apply these concepts to the domain of co-creation processes and future-oriented innovation as well as using them as a theoretical foundation for Theory U. This process of pre-adaptive niche creation is one of the theoretical foundations for the approach of Emergent Innovation (Peschl and Fundneider 2015, 2017a).

Challenging the "ideology" of planning and controlling in classic management, such a perspective gives rise to the alternative *paradigm of enabling*. As an implication (see, for instance, Peschl and Fundneider 2017a) we will have to question and rethink these classic approaches of management by acknowledging radical uncertainty and unpredictability especially in our time that is characterized by high levels of complexity, uncertainty, unpredictability, exponential dynamics, digital technologies, and networks. We will show that

the concepts having been discussed above in combination with the approach of Theory U offer a powerful theoretical foundation and framework for such an alternative understanding of future-oriented management and innovation. This is in line with Kauffman's (2014) perspective that we "do not yet recognize the potentially enormous power of this often unstabile emerging adjacent possibles, the very opportunities evolution creates... for itself, the very opportunities the evolving economy, governmental structures, laws, regulations and enabled behaviors, strategies, that create yet new adjacent possible opportunities into which we become. If so, and for human life if we cannot know what we enable, how do we do so wisely? How in human life do we garden the partially unprestabile and unintended adjacent possibles into which we become, flowering or metastasizing?" (Kauffman 2014, p 7) As we will see in the following section, the Presencing (Scharmer 2007) approach might point into an interesting direction for providing a possible answer to this question.

### Innovation by learning from the future and cultivating emerging potentials

In order to innovate in a future-oriented manner, we have to shift our perspective from the past and present to the future. This kind of innovation has to go beyond problem solving, out-of-the-box-thinking, trial-and-error learning, as well as learning and extrapolating solutions from the past to the future (Peschl, Fundneider, and Kulick 2015). Rather, we have to address the core issue of this paper, namely, *how should we innovate and design for a thriving and prosperous future?* How can we realize *innovation* that is understood as "Emergent Innovation" (Peschl and Fundneider 2013, 2017) within this ontological/epistemological framework? More specifically, we have to deal with the following guiding questions: How do we develop new Actuals and adjacent possibles in the flow of the becoming of reality? How do we identify potentials in a new niche and what are its possible new not yet known (sensible) uses, purposes, and/or meanings? How do we create and/or identify them in a meaningful and sustainable manner?

From such a perspective, the future allows for, offers, and affords (Gibson 1986; Chemero 2003; Peschl and Fundneider 2017) opportunities for specific (novel) behavioral actions (possibly leading to new innovation artifacts). We are confronted with what we refer to as one of the innovation paradoxes that concerns the polarity between (radical) novelty vs. connectedness, intelligibility and transferability to existing structures ("Anschlussfähigkeit"): on the one hand innovative behavior or artifacts should be novel or even radically new. On the other hand, there is the requirement that the level of novelty is not so "far out" that nobody can understand it or cope with it any more. This paradox concerns the ability of a cognitive system (or market) to "understand", cognitively accept, and fit into existing mental frameworks/models what this completely novel artifact is about or

how it could be useful (for instance, for a possibly not yet known use or purpose). Finding an optimal balance between these two poles seems to be the key challenge for every radical and future-oriented form of innovation.

Looking more closely at this paradox and at classic approaches to innovation, such as stage gate processes or creativity techniques (Cooper 1990; Baregheh, Rowley, and Sambrook 2009; Tidd and Bessant 2009), reveals that the key issues can be summarized as follows: (i) It is primarily our thinking and creative acts that generate ideas in our mind. (ii) These ideas are the result of a process of extrapolation from our past experiences into the future (compare the predictive mind hypothesis from cognitive science; e.g., Clark, 2013, 2016; Hohwy, 2013). (iii) From an epistemological perspective, reality only plays a minor role in this process of generating novelty, as it is our mind that wants to shape reality according to its own ideas (hylomorphic approach) rather than being shaped by reality. (iv) The Future plays almost no role in these classic approaches. Hence, following such classic approaches to innovation and creating novelty we are in a mode of trying to take *control* over our environment rather than entering into a mode of *cooperation*, *co-becoming* (Roth et al. 2016), or *correspondence* (Ingold 2013) between our cognition and our (future) environment (compare also Peschl 2019). How can such an alternative approach to innovation be realized? That is the point where Scharmer's (2007/2016) Theory U/Presencing comes in.

### Tapping unfolding reality

The underlying question we are confronted with here is ***what is the source of the future purpose or final cause?*** Where does a possible sensible use come from? Is it primarily our mind, our thinking, our creativity, ideas, or concepts according to which we try to shape our environment and/or innovation artifacts? Or is it the environment, the space of adjacent possibles, the (future) potentials that shape our minds and, by that, guide our transformation activities resulting in new Actuals, innovation artifacts, new behavioral interaction patterns, etc.? We will see that it is not an either-or question. What can be said from the onset, however, is that the important role of reality and its future potentials as well as giving up control are at the center of our considerations.

One of Scharmer's (2007) main claims is that we have to acknowledge that the environment plays a major role in innovation processes (and not only the creative mind of the innovator). This implies that we have to give up the idea of having a clearly defined goal or purpose for the innovation in mind before starting to interact with the environment (compare the discussion on (Aristotle's) hylomorphic approach to innovation, design, or making; Ingold 2013; Ainsworth 2016; Peschl 2019). Furthermore, if this goal or purpose might emerge (Mittleton-Kelly 2007) and co-become in the process of engaging with and "corresponding" to the environment (Ingold 2013, Roth et al. 2016), we are facing the

question of how to identify this purpose and what are “adequate” goals worth pursuing so that a successful and thriving innovation might emerge. In other words, the challenge is to develop strategies avoiding that the resulting novelty or innovation is *not completely arbitrary* (as it is the case in most “out-of-the-box-thinking” driven creative processes) and fulfills a deeper purpose that is coherent with emergent (future) environmental potentials/adjacent possibles and dynamics (compare innovation paradox above).

In the field of innovation this is one of the key issues, if the aspiration of the planned innovation activities goes beyond incremental innovation, adaptation, or optimization (Ettlie, Bridges, and O’Keefe 1984; Baregheh, Rowley, and Sambrook 2009). Understanding innovation as radical, disruptive, profound, future-driven and/or emergent (Hopp et al. 2018; Peschl and Fundneider 2013, 2017) leads to these questions concerning the source of the deeper purpose and meaning. The perspective having been developed in the sections above can give us a pointer how this challenge could be addressed in an alternative manner. Combining it with Scharmer’s (2007/2016) Presencing approach both sheds a new light on these issues and gives some theoretical foundation to Theory U.

One key challenge in such a future-driven form of innovation is the issue on how much *control* we are exerting on the becoming of reality. In this context “control” refers to the fact that our mind and cognition functions like a prediction machine; as is shown by the predictive mind/coding approach in cognitive science (e.g., Clark 2013, 2016; Hohwy 2013) there is empirical/neuroscientific evidence that the main function of our cognition consists in projecting experiences from the past and verifying them in the reality. This implies that our perception and cognition are heavily determined by our already existing knowledge and that we almost can *not* “see” what we do not expect and what does not fit into our patterns of knowledge. What we are facing here is what I want to refer to “*epistemological or cognitive control*”; it is the biggest obstacle for opening up to an unfolding, uncertain, and unknown future, and, hence, for bringing forth novelty. Epistemological control defines and constrains the space of possibilities, the space of what may emerge in the realm of adjacent possibles.

On the other hand, giving up control implies opening up our mind for unexpected Possibles, for exploring a future and a succession of spaces of adjacent possibles that is open-ended, for a world that is *novel* and that wants to *emerge* beyond our projections, expectations, and our predetermined frames of reference. “Not restricting what you will consider to what you know already opens you up to experiencing the vast unknown; and in that you are likely to encounter what is to you the new... Being out of control... can be seen as offering more options than we could, ourselves, imagine. Thus, it is a way of increasing our creativity because we have access to (for instance) ideas which would otherwise not have come to our minds.” (Glanville 2007, p 1189 & 1195) Only if we let go from our past experiences we will be able to “see” potentials that are going beyond our projections from

the past (both individually and organizationally). This process of letting go and reframing is also at the center of Scharmer's (2007) first phases of his Theory U approach. It is the prerequisite that we may enter openly into the yet unknown space of novelty, the space of "not yet" and of adjacent possibles potentially leading us into new purposes and uses.

Giving up (epistemological) control does not only imply that we try to perceive reality with an open or beginner's mind and with "fresh eyes" (Scharmer 2007, p 39 & 244), but also that we learn to see the *future of reality as an emergent and unfolding phenomenon carrying in itself a dynamics of bringing things into actuality*. I.e., the goal or the purpose is not clear from the outset, but (co-)emerges in a process of cooperation and co-becoming with the environment. What do we mean, when we understand the purpose or the final cause (for instance, of an innovation) as being an emergent phenomenon developing in a process of co-becoming? Concepts from Aristotelian philosophy, from system's science and second order cybernetics, as well as from Scharmer's Theory U can shed some light on this question.

As we will discuss later, Ingold (2013 [p 115], 2014), Roth et al. (2016), or Peschl (2019) show that producing an innovation artifact can be compared to a kind of ongoing dialogue between the creator and his/her material. Both systems are interacting, engaging actively, and mutually changing and transforming themselves in a recursive manner; they co-become (see zipper metaphor above). This is not only a process of interaction, but a form of *correspondence*. Both creator and material "find to each other" by ***mutually shaping each other*** according to the (yet unknown) purpose that wants to emerge. The final (innovation) artifact is not known in advance but reveals its form and purpose in a process of correspondence and co-becoming.

## On the role of adjacent possibles and potentials in an understanding of innovation as learning from the future as it emerges

"...the cause lies in the future... Closed circular causality, thus, bridges the gap between effective and final cause, between motive and purpose...no longer does one have to concern oneself with the starting conditions—as they are automatically provided by the end conditions. To be sure, this is the case, but the matter is anything but simple: only certain values of those conditions provide a solution for the processes within the circle; the problem has become an "Eigen-value" problem. (H.v.Foerster 2003, p 230)

In this section we are going to expand on the concept of adjacent possibles and potentials and what role they play in the context of Theory U. We will show that potentials are about "*what is not yet here*", or, in Scharmer's (2007) terms, what still has to be born,

what wants to emerge. We will develop further our theoretical framework that will act as a foundation for the process of Theory U, in particular, for the phase of Presencing. We will establish a link between the concept of Presencing on the one hand and sensing, identifying, and cultivating potentials as well as the concept of “adjacent possibles” on the other hand. Based on this framework, we will relate these insights to the principles of Presencing (e.g., Scharmer 2007, p 183ff) and develop a more profound understanding of what it means to “learn from the future as it emerges”.

## Learning from the future as it emerges

At the center of Scharmer’s Theory U we can find his concept of a future-based understanding of learning (and innovation). It is opposed to a concept of learning from the past (Scharmer 2007, p 467; Kolb 1984) and finds its expression in, what Scharmer refers to as the discipline of *presencing* or in his idea of “*learning from the future as it emerges*”. (Scharmer 2007, p 52) Let’s take a closer look at what Scharmer says about this concept and on which principles it is based.

Presencing happens at the interface between the past and the future: as we have seen in the zipper metaphor (see Figure 1) a system (be it a person, as social system, or an artifact) is always the result of its history, a result of its process of becoming. At the present point in time a new space opens up, the space of adjacent possibles or potentials, “the *dormant self, the one that is waiting within us to be born*, to be brought into existence, to come into reality through our journey ahead. Presencing is the process of connecting these two selves. To connect our current with our authentic self. To move toward our real self from the future.” (Scharmer 2007, p 189) Abstracting from our classic understanding of “self”, one can see that this process is about bringing into existence what is already dormant or latent in a system and what is driven by and directed towards a thriving future.

Scharmer explains the neologism of presencing as blend of “sensing” and “presence”. By being in a state of mindfulness (see, for instance, Rigg 2018) and of being completely in the present and not only perceiving what is there (“Actuals”), but what could be, we may move into a process of sensing from the future. By doing so, we connect to what Scharmer (mysteriously) refers to as “the Source”, a source that lies in a thriving future and that attracts us and that “wants” to come into being, a potential that strives for coming into actuality; “...perception begins to happen from a future possibility that depends on us to come into reality. In that state we step into our real being, who we really are, our authentic self. Presencing is a movement where we approach our self *from the emerging future*.” (Scharmer 2007, p 163) Furthermore, he states that “Presencing happens when our perception begins to connect to the source of our emerging future.” (Scharmer 2007, p165). How could we possibly understand this (“mysterious and anecdotal”) notion of (higher) “Self”,

purpose, and “Source” and its relation to presencing?

Although being rather on an operational side, Scharmer develops several principles on which the approach of presencing is based. Let’s take a brief look at the most important ones:

1. *Presence and awareness*: In order to enter into the process of presencing one has to be in a state of high awareness and presence; being open to and aware of what is (in the outside and inside world) is key for identifying and understanding emerging potentials.
2. *Sensing and knowing from the inside*: normally, we perceive phenomena from the outside, we consider their shape, qualities that can be detected by our sensory systems, functions, behaviors, etc. For tapping future potentials it is necessary to switch perspective and deeply immerse into the world and try to achieve an understanding from the inside (out) (Scharmer 2007, p165f; Bortoft 1996; Peschl and Fundneider 2013,).
3. *Primary knowing and wisdom*: Closely related to the previous point is what Scharmer quoting Varela, Thompson, and Rosch (1991) refers to as primary knowing: a perspective of wisdom is suggested in which it is essential to have a profound understanding of the phenomenon/world on the level of its being, of what it is in its *core* or *essence* (compare also Peschl and Fundneider 2013, 2015). As we will see, only if we know the very core of a phenomenon we will be able to “see” its future potentials that have not been tapped yet and might lead to fundamental and thriving innovations. This is achieved by assuming a perspective of wisdom.
4. *Blurring the border between mind and the world*: This point is related to the requirement of deep immersion and of reducing (epistemological) control. It is about discovering the deep interrelatedness and embeddedness between mind/cognition and world. The environment is part of our mind and vice versa.
5. *Correspondence and surrendering*: Although Scharmer (2007) does not explicitly refer to this concept<sup>3</sup>, it is a consequence of the previous point. As we have seen already, it is about the process of co-becoming between cognitive system/creator and his/her material, shaping and being shaped in an unfolding reality. It is a form of surrendering or, as Ingold (2014) refers to it, undergoing to the world and its unfolding (see our discussion below).
6. *Letting go and the eye of the needle*: If one wants to encounter the unknown and an emergent future it is essential to let go; however we consider this to be more than “everything that is not essential must go” (Scharmer 2007; p 184) Rather, it concerns actively lowering our epistemological control and projections, leaving behind our past experiences, judgments, and plans, and get free for what wants to emerge. Normally,

this is not going to happen automatically or spontaneously; it takes an active effort and, in many cases, also courage. It implies that we have to leave our comfort zone and certainties and move into a space of the unknown and uncertainty. It is like passing through the eye of a needle, a kind of “rebirth” of our mind. In the beginning, this might lead to an unpleasant emotional state of fear, uncertainty, or instability and one (or an organization) has to learn to bear it and to deal with such emotions.

7. *Empty space and silence*: The activity of letting go leads us to entering an empty space both in our mind and in our environment. It is this emptiness and stillness that gives novelty some space to emerge and enables us to listen to novelty in the form of highly fragile and subtle potentials that want to emerge in the field.
8. *The power of place, body, and Enabling Spaces*: For such a sophisticated and fragile embodied process involving cognition, emotions, and the body to be successful it is necessary to provide an adequate environment which we refer to as Enabling Spaces (Peschl and Fundneider 2012, 2014) or, as Scharmer (2007, p 187) calls them, a holding space of deep listening. It is a space that facilitates getting in resonance with oneself and coming into contact with an emerging future.

### What we can learn from Aristotle: Reconsidering potentials and Actuals

Future-driven innovation always implies having to acknowledge that we are dealing with an unfolding, incomplete, and open-ended reality. As has been shown in our discussion about Bloch (1975, 1986) and adjacent possibles, reality is always in a state of “not-yet”, it is always more than what we can perceive in the current moment. **Innovation** understood in this sense, similarly as presencing, is an **emergent process trying to bring to life what is “not yet”**. This is what Foerster (2003, p 230) means when stating that the “cause lies in the future”; as we will see in this section, this idea is closely related to Aristotle’s final cause. It leads us to understanding that the *future (at least partly) drives the present* and that we have to shift our focus from *efficient cause to final cause* if we want to innovate in a future-oriented manner. If future states (at least partly) determine present states and how they might develop and unfold and if we want to understand the processes involved more profoundly, we will have to take a closer look at the concepts of potentiality/potentials and actuality/Actuals. As we have seen above, Bloch’s (1976, 1986) “not-yet” and Kauffman’s (2008, 2014) notion of Actuals and (adjacent) Possibles were a first approach to these issues. However, we suggest to go back as far as to Aristotle’s (1991a) *Metaphysics* in order to dig deeper and achieve a more profound understanding of what is at stake if we take seriously the importance of the future’s influence in the context of innovation and Theory U.

As we have seen above any object or phenomenon is always a composition of matter and form. I.e., material cause represents its material basis or substance and form is the way

how this material substratum is put together. Together they form a unity with a specific meaning, functionality, and purpose. In this context it is important to introduce Aristotle's distinction between *potential(-ity)* (Latin: *potentia*) and *actuality* (Latin: *actus*). The Ancient Greek term for *potentiality* is *dunamis* (δύναμις) and refers to potential, capacity, (cap-)ability, or possibility. Aristotle (1991a) distinguishes between two forms of *dunamis*: (i) in its first sense *dunamis* means that a thing has (in itself) the capacity and the power to produce a change, it can be the source of change into something else or into itself qua other (1046a12). For instance, the dispersed Lego bricks have the implicit capacity to be assembled into a meaningful and functional object. This can be achieved by an external force, action, transformation, or movement (“κίνησις/kinesis”) in the Aristotelian sense.

(ii) The second meaning of *dunamis* is not so much related to movement (or being moved/transformed), but rather to *actuality* (*energeia* [ἐνέργεια] and *entelechia/entelechy* [ἐντελέχεια]) (Aristotle 1991a, 1048a25). Without going into the details of this sophisticated discussion by Aristotle and his interpreters (e.g., Cohen 2016) this means: rather than putting an emphasis on change, actuality focuses on the capacity of an entity to be in a different and more *complete* or “*perfect*” state. It refers to an object's tendency to reach its complete state, its actuality. In this sense, reality (and any cognitive system, object, artifact, entity, social system, organization, etc.) is conceived as being an unfolding process that has in itself a latent directedness towards the realization of its (highest) potentials leading to its (emergent) actuality, *telos*, purpose, and *entelechia*. This tendency towards an emergent *telos* is closely related to the entity's potentiality and *final cause*. Aristotle (1991a, 1048b1–3) makes an analogy comparing the relationship between actuality and potentiality to someone who is awake vs. someone who is asleep or a lump of matter vs. a finished sculpture or piece of art.

As an illustration, Cohen (2016) introduces the example of a piece of wood that can be shaped into a table or into a bowl. Hence, the piece of wood has at least two potentialities: it can become potentially a table or a bowl. The more complete state of wood, its actuality, is a table or a bowl. The piece of wood has in it the potentiality to become a table or bowl. This is exactly the situation we are in when we are innovating or in the process of presencing: we are confronted with more or less (un-/pre-)formed matter and have to find ways for bringing or transforming this potentiality into a more complete state of (sustainable or thriving) actuality (i.e., the innovation artifact). Here we are facing a shift towards a new form (formal cause) and purpose (final cause).

In this context it is important to understand that this shift implies a *priority of actuality over potentiality* (in analogy to the priority of form over matter). Actuality has priority through final (and formal) cause: “Things that come to be moved toward an end (*telos*)—the boy becomes

a man... Form or actuality is the end toward which natural processes are directed. Actuality is therefore a cause in more than one sense of a thing's realizing its potential... one and the same thing may be the final, formal, and efficient cause of another.” (Cohen 2016, p 13f)  
That is the (metaphysical) reason, why we suggested that **future-oriented innovation should primarily focus on final cause and purpose.**

### The zipper metaphor reconsidered

As an implication we suggest to revise the zipper metaphor and add a third dimension: from the perspective of our discussion about potentials and actuals as well as from Theory U it has become clear that it is no longer sufficient to look at innovation processes only as more or less undirected transformation and/or combination of (adjacent) possibles into new actuals. Rather, the dimension of final cause, “perfection” or, as Scharmer (2007) puts it, of “higher purpose”/highest future possibility has to be considered as well (see Figure 2).

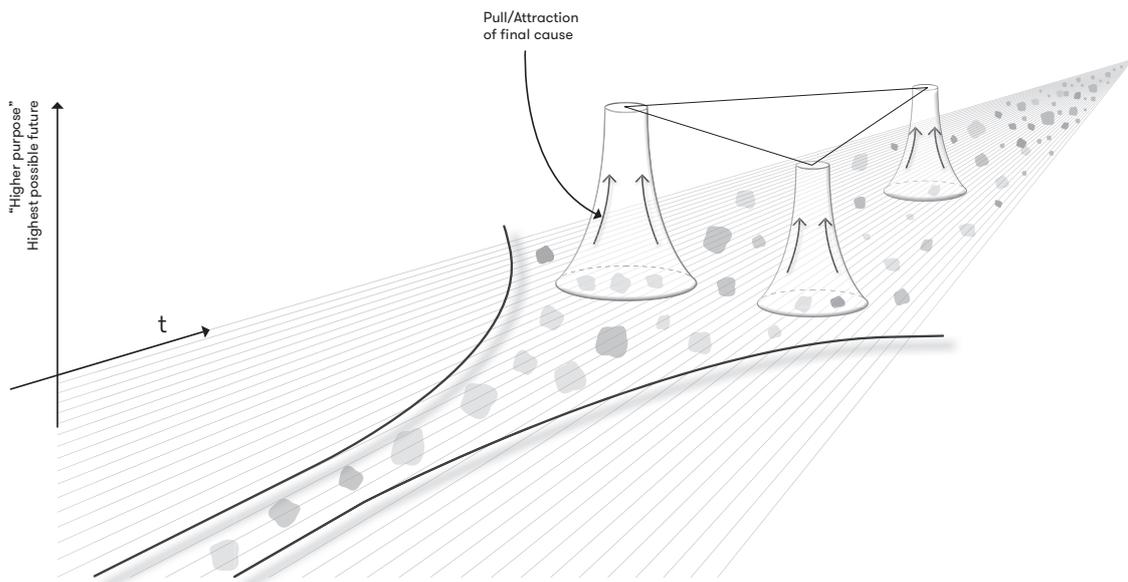


Figure 2: The zipper metaphor 2.0 — adding the aspect of “highest possible future” and purpose as a third dimension gives a direction to the transformation process. The final cause exerts a pull to this process and is co-responsible for bringing forth a thriving future.

Introducing the domains of meaning, (higher) purpose, and goals in this revised version of the zipper metaphor implies that we are going beyond the almost exclusively material or mechanistic realm of cause-effect relationships. The space of adjacent possibles receives a semantic change and (future-)purpose dimension. By identifying the core of the object of innovation and its potentials we are entering not only a perspective of wisdom (e.g., by radically changing the standpoint and knowing it “from within” (Scharmer 2007)), but, by doing so, we touch upon a future aspect: we are getting in touch with the highest future possibility and by making sense out of and relating such future possibilities the whole process receives an orientation; it is pulled by final cause and attracted by a potentially thriving future. It is not only the creator’s (or the innovation team’s) mind(s) that are responsible for bringing forth novelty and creativity; rather, it is a process of co-becoming and co-creation between the environmental structures and (future) dynamics and the involved extended cognitive processes leading to a new stable interaction pattern. New niches might emerge with formerly unknown uses and novel possibilities of interaction patterns serving potentially profound (future) human needs.

## Discussion and implications

In this section we are going to bring together the concepts having been developed and discussed above. Let us recap what are the overall goals of this paper:

- (i) Figuring out what happens when we move from the domain of the known to an unknown and uncertain future (see Figure 1 and 2);
- (ii) Understanding more thoroughly what Theory U implies by the concept of “learning from the future”;
- (iii) Developing a sound theoretical framework into which Scharmer’s Theory U approach, and more specifically, the process of presencing can be embedded and
- (iv) what are the implications and learnings from this framework for our understanding of Theory U and how they can be applied in future-oriented innovation processes.

In the previous sections we have developed a good understanding of what are potentials and adjacent possibles and how they might be used in order to cultivate and evolve the “not yet” and how it might be brought to life. In the following sections we are going

to take a closer look at some of the implications for Theory U and what such a perspective that is deeply rooted in potentials means for innovation processes that are driven by the future.

## Potentials/potentiality and Actuals/actuality in Theory U

In the context of Scharmer's (2007) Theory U the relationship between potentiality and actuality plays a central role although Scharmer only implicitly refers to these concepts, for instance, when he states: "Connecting with the highest future possibility and/or with the highest (future) Self." (Scharmer 2007, Table 20.1, p 366); or: "Presencing, the blending of sensing and presence, means to connect with the Source of the highest future possibility and to bring it into the now." (Scharmer 2007, p 163); or: "As a consequence, the essence of this view of the human being is to create through connecting to one's highest future possibility, one's authentic Self." (Scharmer 2007, p 444) It is also closely related to Scharmer's (2001) concept of self-transcending knowledge.

What is common in these statements is the idea of bringing or transforming potentiality into actuality. As an illustration, Scharmer (2007, p 402) uses the metaphor of a seed that needs continuous cultivation, nurturing, and attention in order to grow, and finally evolve its highest potential (i.e., bringing forth fruits). This metaphor also shows that such a process is open-ended, directed towards the future, driven by final cause or purpose (bearing fruits and perhaps leading to reproduction), and that the seed has to die in order to develop its full potential and finally can bring its full actuality to life. Furthermore, such a seed needs a nurturing environment to make these processes happen (cf. Enabling Spaces; Peschl and Fundneider 2012, 2014).

Thus, Theory U suggests a move from the known to the unknown (future opportunities, potentials, "not yet") and back to the known (see Figure 3); however this movement must not be seen as a process of adaptation or reaction to (known) problems and challenges. Rather, it is about (pro-)actively co-creating/co-evolving new environments, problem spaces and niches, and shape the future in a sustainable and thriving manner. It is about connecting the past to the future (Scharmer 2007, p 401) and about tuning into, listening to, and getting in resonance with future potentials and developing them in a process of mutual correspondence (cf. Ingold 2013; Peschl 2019).

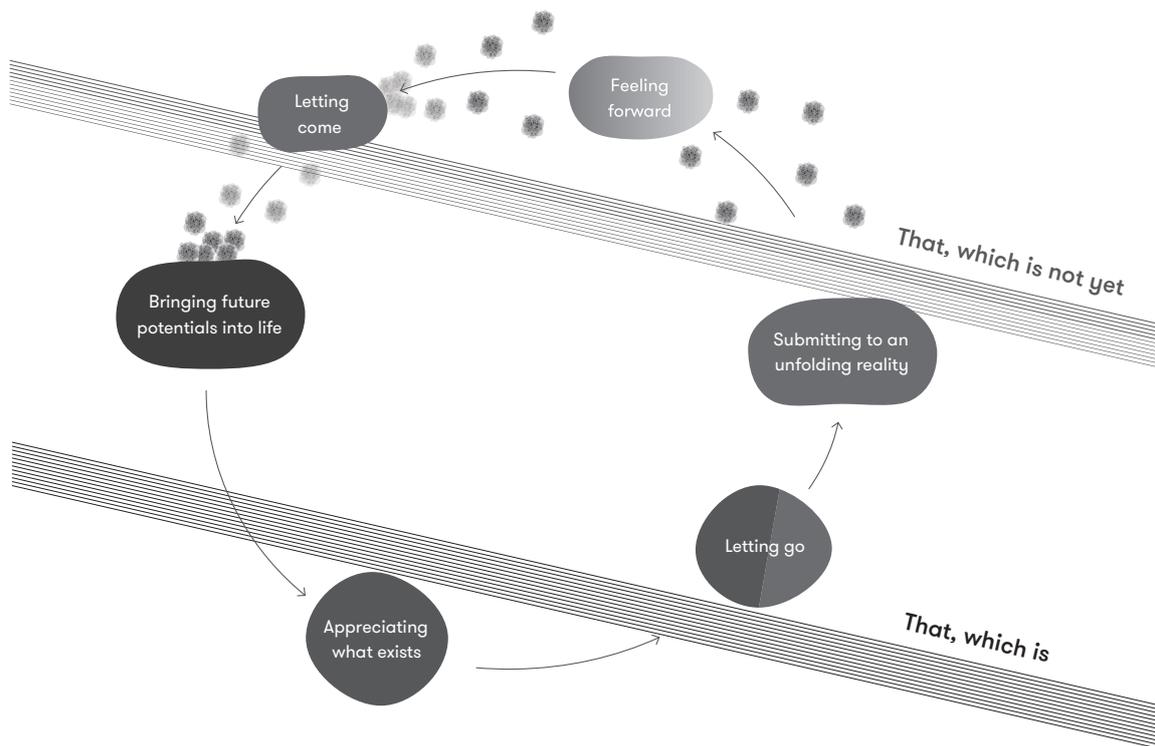


Figure 3: Innovation and Theory U as a process moving from the known (i.e., what is, Actuals) to the unknown (“not yet”, potentials) and back to the known (new Actual or new artifact) in a circular manner (this figure has been co-developed with Carina Rohrbach).

### Innovation as undergoing, submitting, and corresponding to reality

One of the most important implications of the approach having been discussed here as well as of Theory U/Presencing is a radical shift in mindsets and skills: it is about the *role of the environment* in future-driven innovation and knowledge creation processes. While classic approaches are based on the (implicit) assumption of a creative mind “dominating” over reality, we suggest to *reverse* this relationship. I.e., the hylomorphic perspective is replaced by a relationship of *co-becoming* and *correspondence* (see also Peschl 2019). This issue is closely related to our discussion of giving up epistemological control and developing an attitude/virtue of humbleness.

As Ingold (2014) suggests, creativity and creation of new knowledge do not (only) happen inside the creator’s mind/brain, “but in their attending upon a world in formation. In this kind of creativity, undergone rather than done, imagination is not so much the capacity to come up with new ideas as the aspirational impulse of a life that is not just lived but led. But where it leads is not yet given. In opening to the unknown—in exposure—imagination

leads not by mastery but by submission. Thus the creativity of undergoing, of action without agency, is that of life itself.” (Ingold 2014, p 124) In a way this calls for an agent to “*think and act with the material*” (rather than thinking only with his/her mind/brain). However, “thinking with the environment” is not meant primarily in the sense of offloading cognitive effort, cognitive load, or tasks to the environment (such as when using a computer for doing complex computations or storing huge amounts of data; compare the extended approach to cognition; Clark 2008; Clark and Chalmers 1998; Menary 2010).

Rather, it is about anticipating (not in the narrow sense of predicting) possible future states of the world by intimately engaging with the world. In his work on craftsmanship Sennett (2008) stresses the role both of the material and the hand. By developing what he refers to as “material consciousness” (Sennett 2008, 199ff) he shows the importance of being curious about one’s material and of knowing it deeply. In our terminology this can be translated into having a profound knowledge about potentialities and adjacent possibles by knowing them “from within.” In this context “thinking with the hand” does not only mean to “think about” the world, but to enter into a (n existential) process of co-becoming and corresponding with the world (Ingold 2013; Roth et al. 2016; Peschl 2019), or to submit to the world. In being so close to the material, we can be both with and “one step ahead of the material” (Sennett 2008, p 175). We are not imposing our ideas on the material, but we are “feeling-forward” (Ingold 2014, p 136f; see also Figure 3) together with the material. Both the material and the creator/agent co-become and enter into an emerging unity going in the direction of a yet unknown creation.

“This is a matter not of predetermining the final forms of things and all the steps needed to get there, but of opening up a path and improvising a passage. To foresee,

in this sense, is to see into the future, not to project a future state of affairs in the present; it is to look where you are going, not to fix an end point. Such foresight is about prophecy, not prediction.” (Ingold 2013, p 69)

What Ingold calls foreseeing is closely related to the processes happening in the context of one possible interpretation of presencing, namely, in the sense of “*pre-sensing*”. As we have seen, such a perspective on creating novelty and innovation emphasizes the role of the environment. Instead of a creative mind, reality itself is the primary source of novelty by providing a space of adjacent possibles/potentials. The temporal sequence/causality is reversed: it is not the creative idea leading to a transformation of the environment, but the potentials in the environment leading the dynamics of the mind and inviting it into a close cooperation, co-creation, and co-development of its potentials with the environment. As a consequence, we have to *undergo* reality. This means that we have to “move upstream, to a fount of incipience where ideas have yet to crystallize out from the flow of action...

imagination is another word for the aspiration of not-yet-being. As such, it leads from the front rather than directing from behind. But *where* it leads is not yet plotted out before the act begins.” (Ingold 2014, p 135) What Ingold describes here is in accordance with our discussion about the importance and priority of emergent final cause (over efficient cause) and bringing potentiality into actuality. “Leading from the front” implies that the emergent final cause/purpose attracts, “pulls”, or leads the dynamics of the transformation/innovation processes rather than “being directed from behind” by the efficient cause of the mind trying to shape or manipulate reality according to its own ideas. The creative mind is engaged with the material and follows its form-generating potentials by entering in a joint process of growing and co-becoming. This is what we refer to as (innovation by) *correspondence* (see also Ingold 2013, Roth et al. 2016; Peschl 2019).

One final important point that follows from this approach: it might seem that the cognitive agent is put into a rather passive role in such an understanding of innovation and knowledge creation processes. This is misleading, however, as the innovator has to be not only highly engaged in deeply knowing his/her material (from within), but he/she has to *actively listen* to and interact with the material and its potentials. Hence, undergoing is not passive, it is “active undergoing, in which submission leads, [it] is a kind of *action without agency*... you do not initiate it; rather, it *behooves* to you... It has no point of origin; it cannot be traced to an intention... It is rather part of a never-ending process of attention and response... Just as the ‘already’ is always behind us,... so the ‘not yet’ will always escape ahead of us, beyond the horizon of our expectations.” (Ingold 2014, p 137f) Hence, what we are dealing here with is a kind of “active passivity” in the sense of actively giving up (epistemological) control and switching to a mode of attentively molding the environment and at the same time being molded by it, of leading and being led at the same time.

## The importance of a mindset of leisure

As we have seen in our discussion about the process of presencing, a special enabling environment is necessary for entering into such a state of submitting and being receptive to future potentials. One key ingredient for such a process is a state of mind that can be characterized best as *re-creation* (cf. also Scharmer 2007) or *leisure* (the German word is “Muße”). Pieper (1989) describes leisure as a “form of that stillness that is the necessary preparation for accepting reality” and “it means, that the soul’s power, as real, of responding to the real—a co-responsence, eternally established in nature—has not yet descended into words. Leisure is the disposition of receptive understanding, of contemplative beholding, and immersion—in the real.” (Pieper 1998, p 50) Hence, leisure is a form of “active stillness” and a mindset of listening in which one opens up and immerses into reality (see also Beatty and Torbert 2003). It is a process of re-creating a current state or

phenomenon by responding and corresponding to the potentials/adjacent possibles that want to emerge. This acceptance of reality (as a result of giving up epistemological control) is a precondition for novelty to be able to arise.

In listening to what wants emerge, one has to (learn to) accept that we are dealing with potentials. I.e., we are confronted with the domain of the yet unknown that is—per definitionem—not fully graspable. In this context, the mindset of leisure is necessary, as we have to rely on intuition, deep immersion and knowledge, on knowing from within (empathic knowledge) as well as on the humbleness and trust that the “right” potentials will be brought to life. This kind of “understanding” is qualitative (rather than “facts” or quantitative knowledge) and fragmentary and we have to engage in processes of deep sense making. As a consequence, we have to reduce our control as “leisure is not the attitude of the one who intervenes but of the one who opens himself; not of someone who seizes but of one who lets go, who lets himself go, and ,go under.” (Pieper 1998, p 51) Only such an attitude will lead to an open mind and re-creation of our thinking and innovation processes.

## Implications for education, organizational capacities, and personal development

### Necessity of acquiring new sets of skills and mindsets

If one is intending to apply such processes for innovation and knowledge creation, we will have to acquire and cultivate future-oriented (epistemic) skills, practices, and mindsets that go beyond classic (innovation) management and leadership skills as they are taught in most MBA programs (mostly focusing on analytical skills, control, planning, etc.). Only then we will be able to enter into a process of co-creating a thriving future by learning from it as it emerges (compare also Miller 2015, 2018):

- *Openness and mindset of enabling (in leadership)*: While classic management has a strong focus on planning and control our approach to innovation suggests to establish a culture and mindset of openness (e.g., by providing strategic timeouts or routines in which employees get some “free time” to engage in observation or deep listening exercises, etc.). From a management perspective this means that management has to be understood rather in these sense of providing an enabling infrastructure: “Enabling Spaces” (Peschl and Fundneider 2012, 2014) or holding spaces (Scharmer 2007, p 187).
- *Receptivity and humbleness to be “im-pressed” and changed by an environmental dynamics that does not follow one’s expectations*: As an implication of openness both attitudes and skills have to be developed that leave behind the mindset of (epistemic) control: i.e., they enable to embrace the unexpected and to be ready to not only reflect, but also to question and change deeply rooted hypotheses, premises, and

mindsets (both on an individual and organizational level (compare also Grisold and Peschl's (2017a) discussion on "Organizational Predictive Mind").

- *Being able to wait/patience*: Emergent processes cannot be "made" or completely controlled. One has to provide enabling (organizational, personal) infrastructures and develop an attitude and culture of patience and humbleness in the sense of being open to wait what "wants" to emerge.
- *Engaging with and immersing into one's environment, unknown opportunities and the space of adjacent possibles*
- *Being able to listen to what wants to emerge and the capacity to identify and to develop a sense for potentials*: We have to learn not to think in or search for solutions in the first place, but in appreciating an uncertain and unpredictable environment that is about potentials and untapped opportunities rather than a given problem- and solution-space. Both the problem- and solution-space are permanently changing (if they exist at all) and dynamically developing; the challenge is to wait for, listen to, and identify these future/emergent potentials leading to thriving innovations.
- *Capacity to acquire deep knowledge and understanding and knowing from within*: Instead of looking and observing from the outside only, one should try to penetrate deeper into the core or essence of the object to be changed (e.g., Scharmer 2007; Bortoft 1996). It is not only about classic perception or observation, learning or knowledge acquisition processes, or about reflecting premises and identifying knowledge frameworks, but about actively interacting with the (organizational) environment: one changes the perspective of an external observer only to an internal perspective of actively being part of and involved/engaged in the processes of intervention and enacting. It is a kind of "thinking with the environment", which does not only result in knowing the (organizational) system and its ecosystem from the inside (out), its core, but also in getting an understanding of its future potentials that are emerging in this process.
- *Being prepared to be "pulled" and attracted by purpose/final cause emerging from potentials*: We do not only have to learn to observe, deeply understand from within, and to listen to potentials, but also to understand that the purpose or the final cause itself is emerging. As an implication, it is not primarily the creative agent who is responsible for bringing about novelty or novel uses/purposes by him-/herself, but the unfolding and enabled environmental dynamics exerts a kind of "pull" towards an emerging purpose. The challenge of the agent/innovator is to create an enabling environment for such a process (see zipper metaphor 2.0 above; Figure 2) and to be open for sensing and bringing this emergent purpose from a state of potentiality into actuality.

- *Love for details and “weak signals”*: In most cases, future potentials are not “obvious”, they are not visible or directly accessible to our senses. Rather, they are hidden and latent (Poli 2006, 2011), they are fragile and need to be brought to the fore as they are not “shouting out loudly”. That is why it is important to learn to listen closely to details and to things that are not explicit, that are silent and in the domain of the “not yet”.

It is important to keep in mind that this applies both to the individual and organizational domain.

Future-driven innovation requires personal change

Any process of future-driven innovation is based on personal involvement. However, as we have seen in the co-becoming/correspondence approach above, it is not sufficient to just apply a technique and/or preconceived concept to the environment and to react to what does not work in the process of realizing one’s idea or concept. Rather, it has become evident that the innovator (and his/her idea or concept) has to fully engage and co-develop with his/her material or artifact in a process of co-becoming. From a learning perspective, this means that one has to change *first* on a personal and existential level (deeply reflecting and reframing attitudes, mindsets, skills, etc.) and only then will be capable of engaging with the material/environment in such an intimate manner as has been sketched above.

The innovator becomes his/her work/artifact

This implies that in such a perspective, we cannot make a clear distinction between the creator and the designed object any longer. The innovator cannot separate him-/herself from the object as he/she is involved and engaged in an existential and personal (and not only cognitive) process of *co-becoming*, of personal change, of being *exposed* to, as well as being *together* and growing with the material. Instead of mastery of the material it is a process of *undergoing* (leading to mastery) (compare Ingold 2014). As a consequence of the previous point we do not only have to acknowledge that the border between the agent and his/her environment/material gets blurred, but that—in a way—the agent becomes what he or she creates (and vice versa). In other words, the process of understanding innovation in such a way is *transformative* on both sides and both have to undergo a process of mutual profound change. Hence, future-oriented innovation as has been developed in this paper always implies a personal transformation as a necessary prerequisite; contrary to most classical approaches to innovation and creativity the creative agent has to change his/her patterns of perception, thinking, as well as of behaviors and even has to go through a more existential transformation.

## Conclusions

Coming back to our initial question of how it is possible to come up with innovations that are not only “creative” and (radically) novel, but that are sustainable and may lead to a thriving future, we have seen that the approach being suggested by Theory U/presencing is a promising strategy. We have shown that the concept of (future) potentials as well as understanding, exploring, and developing the space of adjacent possibles is key for such an approach. As we have seen in the zipper metaphor it is crucial to understand innovation not primarily as a “creative activity”, but as an endeavor of being open to, identifying, and being attracted by future potentials as is suggested by Theory U. Only, if we understand this space of adjacent possibles as the domain of an emergent and unfolding future we will be able to “learn from the future as it emerges” and develop thriving innovations by combining to submit to this domain with the (highest) Self/highest possible future (e.g., Scharmer 2007, p 41f, 401f).

Furthermore, it has become clear that an innovation strategy that is based on the concept of being driven by the future implies that we have to turn most of our assumptions about “innovation management” on their head; most importantly, it is not primarily about “management”, but about *enabling*; we have to give up (epistemological) control and enter into a mode and mindset of co-becoming and correspondence with our world. By doing so we come to understand the object of innovation “from within” and may identify its future potentials that have not been tapped yet. The challenge is to “listen to” or “feel forward” what wants to emerge from these potentials, what wants to be activated and break forth in the untapped potentials of the core of the object of innovation, and make sense of and cultivate opportunities and what wants to be brought to life and actuality.

The resulting purpose or possible value/use (of the innovation artifact) can neither be planned nor is it given in advance, but emerges and unfolds in the process of co-becoming as final cause. As a consequence, we may arrive at an innovation that resolves one of the major challenges and paradoxa in innovation: for being a thriving and sustainable future-driven innovation, it does not suffice to be just novel, creative, or radical/disruptive (Christensen, Raynor, and McDonald 2015), but it has to fulfill somehow in a deeper purpose, it has to be connected to a—perhaps, in some cases not yet known—deep human need. Or, as Hekkert, Snelders, and van Wieringen (2003) put it in the context of industrial design and aesthetics, such an innovation has to be “most advanced, yet acceptable”. Following the approach and mindset having been outlined in this paper, this results in what we are referring to as emergent innovation (Peschl and Fundneider 2013, 2017): on the one hand, it has its roots in the (potentials of the) core of an existing Actual (be it a product,

service, business model, organizational purpose, etc.). Hence, it is compatible with existing mindsets, assumptions, conceptual frameworks, or mental models (of potential uses and users, markets, user needs, or organizational capabilities). On the other hand, it may be completely and radically novel (and not only in the sense of just “out-of-the-box” or “creative”), as it is driven by unknown future potentials that have emerged from the core in this process. As we have seen, this might lead to completely new needs and niches that have been unknown at the outset and that open up the opportunity for a new and thriving future.

Another important implication is that in order to arrive at such future-driven innovations which follow the Theory U based approach, it is necessary that the involved persons (or organization) has to undergo a profound personal/existential transformation as well. In other words, such a process cannot be executed like an abstract and mechanical activity, but the involved stakeholders go through a transformation of their mindsets, attitudes, as well as skill sets (see section above). We cannot expect to shape the future in a thriving manner without being shaped by her in return.

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<sup>1</sup> This metaphor was inspired by a talk of Bernat Corominas-Murtra: “Open-Ended Evolution: Characterization, Consequences and Paradoxes” at the Konrad Lorenz Institute, Klosterneuburg, AT (March 2, 2017).

<sup>2</sup> Without going into details, by making use of an argument from quantum physics, Kauffman (2014; 2016, p 33f) shows that in the domain of Actuals the law of the excluded middle (i.e., either A exists, or A does not exist) applies, while Possibles do not necessarily obey this law. Possibles ontologically can exist and can not exist at the same time (until they get realized; i.e., they become Actuals).

<sup>3</sup> Apart from giving the example of a sculptor shaping matter and being shaped in an almost “intimate” relationship with matter (Scharmer 2007, p 170).