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Design for Emergence – Enabling Stakeholder Liminal Transitions and Innovation Value Pivoting through Complex Systemic Transformations

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Abstract Emerging sustainable innovation value is increasingly being recognized as a key challenge – and one increasingly considered from the perspectives of complex systemic transformations that require iterative learning processes, awareness of complex-adaptive systems, collaboration in multi–stakeholder environments and competencies in meaning *and* value co–creation. Innovating within complex social systems can be challenged by the stakeholder buy-in processes, affective team climate and the multi–dimensional aspects of organizational adoption. We introduce *Design for Emergence* – a meta-design framework to increase innovation community resilience by orienting towards human psycho-social factors, while building social coherence across the systemic micro, mezzo and macro scales of analysis – with the goal of easing stressors within 'liminal space' transitions to *enable* desirable future outcomes, *by facilitating* individual and organizational transformational journeys.

Introduction

Researchers observe that "innovation occurs through the combination and recombination of information and knowledge that are old and new" where "innovation is thus an emergent process" (Cooke, 2013). However, emerging innovation in a sustainable manner within markets, communities and organizations is still viewed as a challenge – and one increasingly related to the processes of learning (Harkema, 2003) within complex–adaptive systems (Carlisle & McMillan, 2006), that require collaboration in multi–stakeholder environments (Sørensen & Torfing, 2011), and are dependent on value co–creation outcomes (Romero & Molina, 2011).

A survey of the research literature suggests that innovation initiatives are faced with a surprising lack of adoption by the key stakeholders across diverse industry contexts and organizational settings – including natural resource management practices (Shiferaw, Okello, & Reddy, 2009), healthcare organizations (Cresswell & Sheikh, 2013), and policy environments (Douthwaite, Keatinge, & Park, 2001). Stakeholder buy-in challenges are posited to be complex and affected by a multiplicity of factors – including impacts of team climate on performance (González-Romá, Fortes-Ferreira, & Peiró, 2009), team-member creativity (Somech & Drach-Zahavy, 2013) and the multi–dimensional aspects of enabling adoption (Pichlak, 2016).

In and of itself, stakeholder adoption is not considered as sufficient for enabling sustainable innovation initiatives. Even when the 'innovation buy-in' has occurred – and the key stakeholders are ready to undergo the innovation journey, further challenges are observed – including maintaining individual well-being (Dackert, 2010), managing affective events (Pirola-Merlo, Härtel, Mann, & Hirst, 2002), and adapting to the new 'boundary roles' described as "complex, contested, and nonlinear" that require a "nonlinear perspective on innovation" (Ferlie, Fitzgerald, Wood, & Hawkins, 2005), and which "occur at several organizational boundaries" (Tushman, 1977).

Nearing the end of innovation initiatives – for those that manage to break through the barriers of stakeholder adoption while staying the course of an innovation journey – researchers observe that the anticipated value is often reduced through challenges in delivering innovation outcomes (Martin & Scott, 2000; Klein Woolthuis, Lankhuizen, & Gilsing, 2005) and lack of new value realization (Chesbrough & Rosenbloom, 2002) – often as the result of insufficient post-implementation usage (Cresswell & Sheikh, 2013).

We posit a research gap in translating the current innovation theories into effective practices capable of delivering sustainable innovation value – when enacted in complex environments, and in a manner optimized for stakeholder participation and innovation outcomes adoption.

Design for Emergence

To respond to the outlined concerns around the feasibility of effectively emerging new value through innovation processes, we introduce the *Design for Emergence* – a practical, applied design methodology intended for multidisciplinary teams and practitioners – to enable flourishing futures and increased resilience across systemic scales (Bergström & Dekker, 2014), human psychosocial contexts (Matin & Taylor, 2015) and social support systems (Sippel et al., 2015; Almedom, 2015).

We introduce approaches for building social coherence (Antonovsky, 1987; Keyes 1998) across systemic scales and levels of analysis (Marr, 1982), with the goal of easing stressors within the 'liminal spaces' (Van Gennep, 1906; Turner, 1987) to impact desirable future outcomes and enable individual and organizational transformational journeys.

The *Design for Emergence* is positioned as a meta–design framework comprised of three core modalities: 1) *Design for Adoption*, 2) *Design for Resilience*, and 3) *Design for Transience*. Each component is a general-purpose meta-design modality with specific design goals and engagement guidelines – intended to simplify practical use of theoretical concepts within diverse, complex innovation environments that require multi–stakeholder collaboration and delivery of broad cross–scale impacts.

The *Design for Emergence* meta-design framework provides a generative design space to 'plug-in' existing systemic design methodologies, implementation tools and innovation best-practices – with the goal of enabling sustainable innovation in complex ecosystemic scenarios, while simplifying the design processes and delivering enhanced stakeholder, organizational and community value.

Design for Adoption

Recognizing that the intrinsic and continued participation of the key stakeholders is essential for the success of innovation initiatives, as exemplified in co-innovation (Lee, Olson, & Trimi, 2012), the *Design for Adoption* eases participation by leveraging motivational theory to support both initial and ongoing stakeholder engagements (Pink, 2009).

Adoption is a critical success factor in multiple industries and community contexts that are increasingly experiencing rapid transformation amid complex systemic challenges, that often mandate a successful integration of conflicting goals (Bledow, Frese, Anderson, Erez, & Farr, 2009). At the same time, many industries are experiencing escalating environmental complexity pressures (Blau & McKinley, 1979; Damanpour & Gopalakrishnan, 1998). In healthcare, this can be manifested as a rapid growth in the number of people requesting access to the health system complexified by an increase in the total number of systemic diseases such as the Alzheimer's, obesity and diabetes, while simultaneously attempting to adapt to the emerging technologies that enable competition from the adjacent market-spaces.

Intense innovation pressures are experienced in key areas such as governance, energy development, banking, insurance, not-for-profit and the corporate innovation sectors – that increasingly need to manage shrinking operational budgets, respond to changes in regulatory environments, and anticipate shifts in the competitive and community landscapes; while responding to growing pressures of market adaptation and sustainable innovation.

Interacting innovation pressures emerge a complex environment. For instance, in health care a common view is that "systems are under increasing pressure to cope with shifting demographics" where meeting the challenges of advancing medicine and health care delivery are "not as rapid as the pace of change" (Keown et al., 2014). In education, the "rapid and far-reaching economic and social changes, driven particularly by the impact of accelerating globalization, increased economic modernization, and transition toward a knowledge-based society" have "transformed higher education systems in many countries from elite to mass, placing colleges and universities under considerable strain regarding infrastructure, resources, and expertise" (Dunrong, 2015). In the public sector services, a common views is that "there are general trends that place great stress", where the "changing demographics mean ageing populations are placing greater demands on health and social services while a smaller proportion of working people are being required to finance the additional expenditure", and where there are "bottlenecks in focusing attention on particular areas of innovation" (Windrum & Koch, 2008, p. 230).

The shifting demographics challenges are also exacerbated by the emergence of disruptive technologies – where the "innovative success is dependent upon the ability of firms to acquire and assimilate new knowledge without disrupting value chain members such as suppliers, customers and complementary innovators" with comparatively "little advice on how to deal with radical, controversial innovations that may also introduce new undesirable environmental, health, and social side affects". This is posited to be further complexified when "in addition to technological, commercial and organisational uncertainties, the developers of such technology typically must resolve social uncertainties", which is viewed as challenging due to the "added complexities and often conflicting and/or difficult-to-reconcile concerns from secondary stakeholders" (Hall & Martin, 2005).

Managing shifting community demographics while adapting to an array of disruptive technologies does not seem to slow-down expectations to innovate quickly – with a paradoxical effect of creating acceleration pressures. For instance, researchers note that China now "centers on what we call accelerated innovation" in a way that's focusing on "reengineering research and development and innovation processes to make new product development dramatically faster and less costly" (Williamson & Yin, 2014) – creating further pressures on the global institutions and multi-national enterprises (MNEs) to enhance "their managerial ability to cope with the accelerating pace of innovation" (Buckley & Casson, 2010).

Innovating for sustainability within such a complex environment – while creating innovations that are sustainable – is viewed as an additionally challenging proposition. Leading researchers explore the "links between agency, institutions, and innovation in navigating shifts and large-scale

transformations toward global sustainability" – in order to identify conditions that might help to "reverse the trends that are challenging critical thresholds and creating tipping points in the earth system"; while attempting to contend with the key identified issues, such as the "lack of incentives for the private sector to innovate for sustainability" and the "lags inherent in the path dependent nature of innovation", which is viewed as compounded by our "incapacity to easily grasp the interactions implicit in complex problems" (Westley et al., 2011).

We posit that the socio-cognitive experiences of the individual stakeholders are integral to enabling complex innovation and ecosystemic transformations – and that, designers must take this individual experience into consideration when designing for complexity.

The process of integrating an individual into the innovation process is a not a new idea. For instance, the transformation of the Finnish innovation system was in part considered from the perspectives of "integrating the individual and the organisational levels", where a key innovation challenge was identified as "how tacit knowledge can be transformed to be useful for the whole organisation, and on the other hand, how explicit knowledge can be transformed into personal 'know-how'" – referencing the SECI 'spiral of organisational knowledge creation' model (Nonaka, 1994) described as consisting of four main modes of conversion – "(1) socialisation (from tacit knowledge to tacit knowledge; (2) externalisation (from tacit knowledge to explicit knowledge); (3) combination (from explicit knowledge to explicit knowledge); and (4) internalisation (from explicit knowledge to tacit knowledge)" (Schienstock & Hämäläinen, 2001).

A key argument that "a knowledge-based organisation is able to generate knowledge and innovation if it manages to transform the very difficult and demanding exchange processes between the two forms of knowledge into routine organisational processes" is viewed as predicated on the "following factors: knowledge vision, organisation forms, incentive system, corporate culture and organisation routines, and leadership" - that, in turn, hinge on the ability of the organizational and innovation ecosystem stakeholders to successfully traverse the 'socialisation phase'; which "creates common understanding and generates trust among group members", and where the "knowledge vision needs to transcend the boundaries of existing products, divisions, organisations, and markets to allow for extensive knowledge exchange even among units with different interests" (Schienstock and Hämäläinen, 2001, p. 63).

We argue that such social traversals are indeed at the crux of any innovation challenge – whether in the knowledge creation phase, or in the other innovation processes. While the innovation literature outlines many formative solution approaches – such as the Accelerated Radical Innovation (ARI) project, with the 'accelerated innovation prototyping' method (Bers, Dismukes, Miller, & Dubrovensky, 2009) – we propose to augment and further enable the existing methodologies with a meta-design framework capable of describing the human psycho-social factors necessary for traversing the innovation spaces of uncertainty and transformation, that can be considered from a liminal transition perspective.

To further understand such social traversal challenges, we posit that a confluence of innovation pressures creates a complex environment of active tensions between the current ('needed for success now') and the emerging ('necessary for succeeding in complex systems') competencies, that include:

CURRENT COMPETENCY	EMERGING COMPETENCY
respond to well-defined challenges	manage continuously emerging issues
master known practices	create new capabilities
compete in familiar marketspaces	identify / enable novel opportunities
leverage existing knowledge	create conditions to 'explore the new'
manage personal achievement	facilitate group success

When unresolved, such innovation tensions can overwhelm the individual psycho-cognitive adaptation and organizational change abilities – exerting a counter-effect of innovation resistance that might act as an inhibitor in enabling sustainable innovation value. Researchers posit that this can be seen in areas such as education reform – where "efforts to reform schools stall" and "educators resist change because they feel burdened or conflicted by the process", and where it's important to "reviews standard conceptualizations of change" while analyzing the "psychology of individuals and the culture of institutions" (Evans, 1996).

Early on, researchers attempted to normalize this apparent resistance to change, and make it more understandable – arguing that, "the vast majority of people who have no *a priori* desire to change may be more typical and even more rational than a small minority of individuals who seek change", even when considering "the intrinsic value of the innovation" – urging to focus on "individuals who resist change" in order to "understand their psychology of resistance", and "utilize this knowledge in the development and promotion of innovation" (Sheth, 1979, p. 274).

As such, researchers posit that indications of innovation resistance include escalating perceptions of risk aversion, low tolerance to failure, insistence on 'patching the problem' with 'quick fixes' and non-systemic linear approaches, engagement structures that impede effective transformation, and mismatches in organizational culture that attempt to measure progress with performance indicators rooted in the perceptions of the 'current state' – instead of orienting towards enabling the new desirable outcomes.

Designing for adoption is further complexified in the presence of multi-organizational teams with different skills, approaches and values – engaging different parts of a shared challenge without full awareness of the relevant capabilities and perspectives. This can contribute to a lack of ability to effectively align collaboration capabilities across organizational and community contexts – resulting in a 'competition of views', 'action paralysis' and appearance of underlying systemic loops capable of

impeding significant progress in innovation initiatives. When the adoption tensions are not actively managed, they can create an environment where key stakeholders are engaged in attempting to deliver complex innovation initiatives while addressing internal mobilization challenges – that can impact an overall readiness to enact innovation.

To mitigate these challenges, we propose to detect, identify and consider the key emerging tensions within innovation journeys as either 'polarities' (Johnson, 1992) or 'dialectics' (Deci & Ryan, 2004), where institutional change is viewed as a "dialectical process", and where "actors espousing conflicting views confront each other and engage in political behaviors to create and change institutions" (Hargrave & Van De Ven, 2006). We content that the 'dialectical' and 'polarity-based' challenges can be best addressed with very different design strategies and management approaches.

With 'polarities', a key managing strategy is to minimize the 'downside' of traversing the negative aspects of each polarity – and to move as quickly as possible to the 'upside'. This strategy works since polarities can not be beneficially 'resolved' in a real sense – and must instead be balanced. Examples include 'individual work' vs. 'teamwork', and 'rest' vs. 'activity' polarities – where, overemphasizing either state does not generally lead to preferred outcomes. In a business context, an example might be a polarity of 'organizational acquisitions' (that can be exciting and energizing, and yet eventually exhausting when prolonged), versus 'process optimizations' (that can lead to efficiencies and be organizationally enabling – and yet often be experienced as stifling when over-emphasised).

'Polarity' – *Dynamic Movement Between Contrasting, Yet Complementary States*
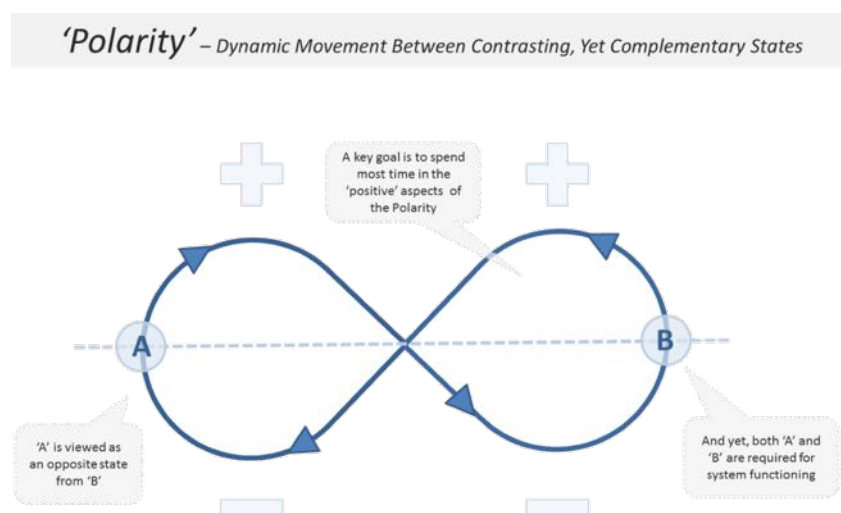
In contrast, managing 'dialectical' tensions is profoundly different – with seemingly incompatible states that are in apparent opposition to one another, at the root of which there might be a perceived paradox. An example might be a healthcare organization that is already over capacitated and under-resourced, and yet expected to serve additional patients and communities with an enhanced level of care. These seemingly opposing systemic states might appear as mutually

exclusive and incompatible with each other – yet allowing for the possibility of innovation convergence through the generation of new options. A key design strategy for managing dialectical tensions is to synthesize new options that have not existed before – out of the common ground of shared yet opposing perspectives, as per the diagram below:
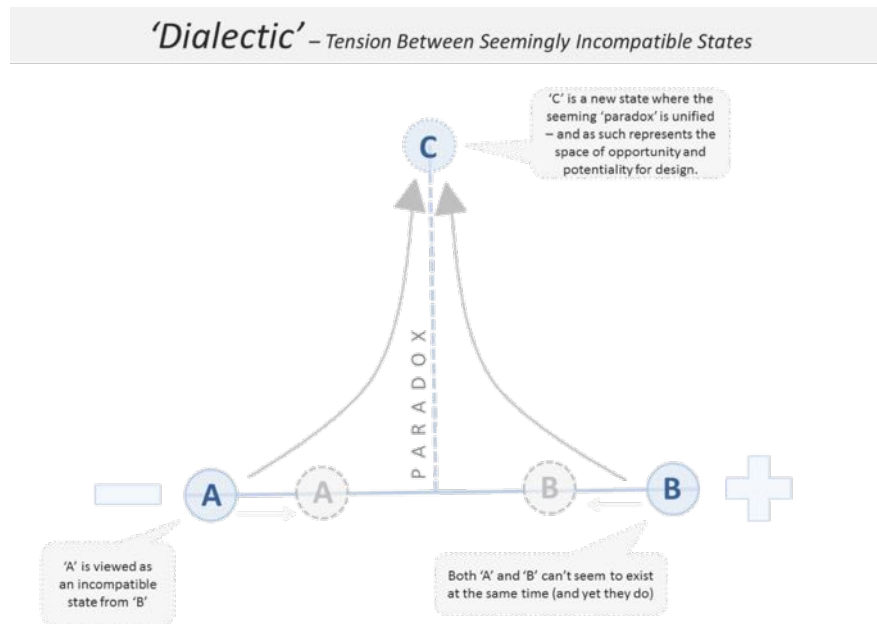
To positively impact the internal mobilization challenges and associated dialectical and polarity-based innovation space tensions, we propose a meta-design modality entitled *Design for Adoption* – informed by the following key design goals:

1) **help build trust**: leveraging 'autonomy', 'mastery' and 'purpose' to strengthen the individual ability to engage the innovation potentials in a generative manner

2) **enable facilitative strategies**: to engage multiple stakeholders with diverse perspectives and create conducive group dynamics

3) **leverage group co-design**: to enable creation of insights capable of achieving positive systemic impacts

To define key criteria capable of emerging a 'minimal design grammar' that can enable such goals, we consider the systemic diagram as per below:
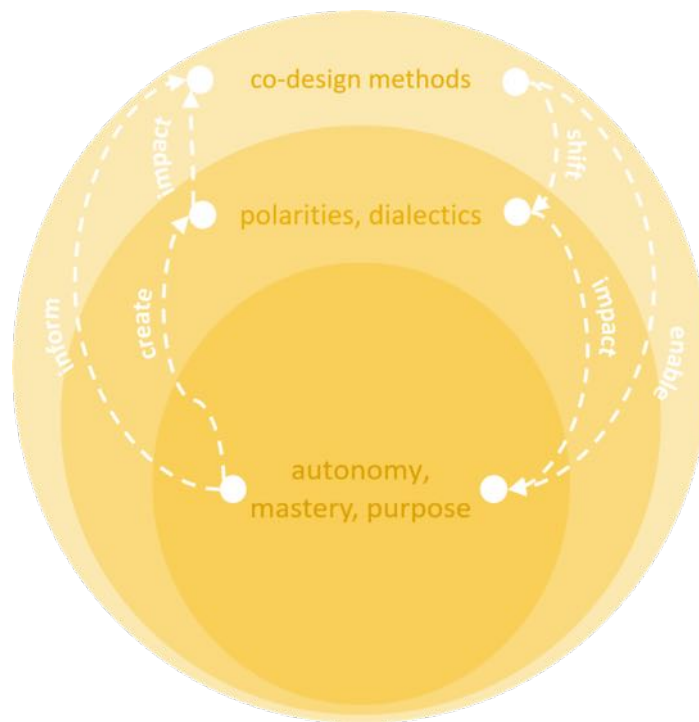
Here, the ability to enact effective 'co-design methods' with the key stakeholder communities is supported by the intentional identification and management of 'polarities' and 'dialectics' – that inevitably emerge through the innovation design process. The identified polarities and dialectics are not avoided – and are instead utilized in a generative fashion to help strengthen and build group trust as well as the stakeholder buy-in.

Simultaneously, the key innovation participants and engaged communities are considered from the standpoints of 'autonomy, mastery and purpose' (Pink, 2009) – where, the iterative changes in the environment are parsed in terms of what they might mean, and how they might impact, the engaged stakeholder contexts.

We posit that the relationships between these three levels of design reveal complex networks and an active space of interaction – that can be further considered from the perspectives of simultaneity (how interactions in one level of design might have immediate correspondences in others), resonance (how nodal points might form between multiple levels of design, and have disproportionate impacts), moving forward-and-backward (how behaviours or artifacts are more or less visible throughout the experience lifecycles, becoming increasingly observable or less measurable), and engagement (identifying inflection points where it might be possible to more or less successfully involve the key stakeholders).

When enacted, the *Design for Adoption* meta-design modality enables successful stakeholder engagements during innovation journeys – by making it possible to build on shared insights (by leveraging trust relationships evolved in psychological safe-spaces), emerge complexity awareness

(by iteratively exposing underlying systemic complexities), and to start building conditions for perceiving preferential 'future worlds' (by aggregating current assumptions and emergent expectations into perceptions of possible futures).

While helping to build initial trust and enabling co-design through the dynamic management of emerging innovation tensions – and starting to align key stakeholders around shared perceptions of the future – the *Design for Adoption* also requires the next meta-design modality, the *Design for Resilience*, to help innovation initiatives deliver sustainable value.

4. Design for Transience

As an innovation initiative nears completion, researchers observe that a change in the underlying value perceptions acts as a stressor (Cullen, Edwards, Casper, & Gue, 2014). To help re-imagine and re-orient value propositions within the enclosed ecosystem, the *Design for Transience* maps how the stakeholder perceptions of value change throughout the levels of analysis (Marr & Poggio, 1982), and suggests to leverage a formal foresight method – such as the 'three horizons' (Curry & Hodgson, 2008) – to explore the evolution of value perceptions from the experienced present to a possible perceived future.

To positively inflect the key 'transience' challenges, the *Design for Transience* is informed by the following key design goals:

1) **build individual awareness of shifts in value-perceptions**: outline perceived value transitions across temporal scales, translating narratives to the individual ('micro') context

2) **map intermediate shifts in value**: correlate 'current' and 'emerging' perceptions of value through the lens of the 'intermediate' (mezzo) organizational, institutional and community stakeholders

3) **map ecosystemic value-changes**: outline relational changes in value through the highest level of ecosystemic analysis – utilizing models such as 'panarchy' (Gunderson, 2001) – to share meaningful narratives with the innovation stakeholders

To explore the systemic relationships between the stated design goals in some further depth, we consider the systemic diagram as per below:
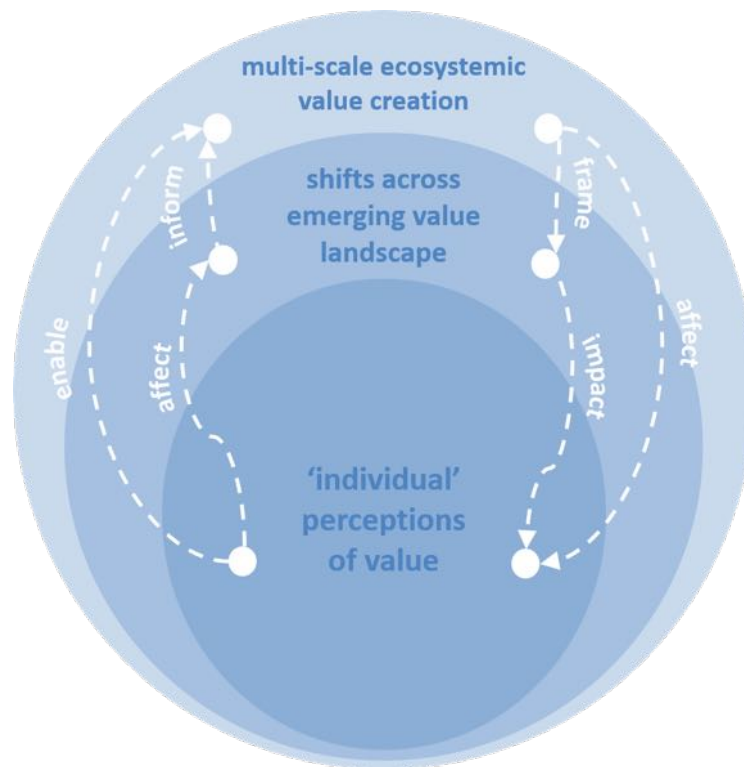
Here, a key meta-design objective is to actively manage the evolution of value perceptions from the experienced present towards the perceived or anticipated futures – with the capacity of creating positive feedback loops when the emergent narratives are connected back to the *Design for Resilience* and *Design for Adoption* modalities.

As such, the *Design for Emergence* is a meta-design framework that articulates value propositions, enhances collaborative potentials and creates an intrinsic resilience by aligning stakeholder perceptions within participating communities – in a way capable of enabling emergent innovation.

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