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The (Re)Design of Ecosystems to Face Grand Challenges—Toward the Management of Creative Evolution

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ABSTRACT

Today's grand challenges have to be discussed comprehensively, addressing the current design and the redesign of social and economic ecosystems. Tackling grand challenges requires a step into the unknown, a situation that is well-characterised today as strongly different in nature from uncertainty and requires specific types of management. This opens the door to radical changes in ecosystems' configurations (new values, new interdependencies and new independencies). Hence, our call for papers for this special issue asked about (re)designing ecosystems to face grand challenges. The papers of this special issue analyse a great variety of empirical situations (energy, organised crime, wind-energy–air quality). They elaborate extensively on how one can manage the complex intertwined processes that lead to exploring both new products/services associated with grand challenges and new collaborations in the ecosystem, enabling the commitment of new players in new partnerships. This editorial highlights three pivotal constructs deriving from the contributions: (A) 'generativity enhancer' as a critical type of action/actor in the redesign of the ecosystem; (B) creative preservation as a critical factor shaping performance; and (C) necessary methods for creating/sparing effective multiple local design spaces. Building on the constructs, it concludes by discussing the (re)design of ecosystems as creative evolution and how to manage it.

1 | The (Re)Design of Ecosystems to Face Grand Challenges

Grand challenges were put on the agenda for scientific research more than a century ago, when Hilbert (1902) published his famous list of unsolved mathematical problems (Howard-Grenville and Spengler 2022). Recent work in management and related disciplines has referred to grand challenges on numerous occasions (e.g., Ferraro et al. 2015; Eisenhardt et al. 2016; Czakon 2019; Tarba et al. 2024), addressing a wide variety of contemporary problems (Mertens and Barbian 2015; George et al. 2016; Buckley et al. 2017). As noted by Fritzsche (2022), however, most grand challenges listed in recent catalogues are rather different from Hilbert's (1902). Instead of abstract scientific problems and research practices, today's grand challenges mainly concern human society holistically, referring to general calls to action such as the United Nations' Sustainable Development Goals. Therefore, today's grand challenges shall be discussed more comprehensively, addressing the current design of social and economic ecosystems and possible interventions to redesign them (cf. Howard-Grenville and Spengler 2022).

Ecosystems constituted by different organisations are highly relevant for management research and practice (Moore 2006). They have been conceptualised from different perspectives and in reference to different economic activities (Jacobides et al. 2018; Granstrand and Holgersson 2020; Pankov et al. 2021). One particular focus in research is directed

toward industrial ecosystems that rely to a high degree on technology (e.g., Iansiti and Levien 2004). Such ecosystems have been scrutinised from various theoretical angles, investigating business models (e.g., Schneckenberg et al. 2018; Spieth et al. 2014; Demil and Lecocq 2010), network constellations (e.g., Adner 2017) and operative platforms (e.g., Gawer and Cusumano 2014).

Management scholars use the notion of ecosystems to address interrelated actors that co-evolve over time (Moore 1996) and generate value together that exceeds the sum of each individual's accomplishments (Baldwin et al. 2024). Driven by complementarities, interdependencies and a lack of hierarchical control (Cobben et al. 2022), structures and operations in ecosystems are in constant flux, with the consequence that there is no stable design over time, but rather an ongoing process of (re)design, resulting from the actions of its members and—if applicable—strategic intervention (cf. Tsujimoto et al. 2018). In reference to these general properties of ecosystems, vast research has studied various design-related questions. For instance, extant research looks at organisations that act as an anchor tenant (Padgett and Powell 2012), network orchestrator (Dhanaraj and Parkhe 2006) or lead organisation (Lorenzoni and Baden-Fuller 1995) of an ecosystem. Another recurring theme relates to the idea of ecosystem-as-structure—focusing on the activities of the actors involved—or the ecosystem-as-affiliation view—in which all actors are considered equally as members of the ecosystem (Adner 2017).

One inherent feature of business ecosystems is that there is constant change in the system. What varies is the locus of change: it might take place in the structures and relationships of the ecosystem itself, or in the way that the ecosystem creates value for customers and other stakeholders (Aarikka-Stenroos and Ritala 2017). Most studies therefore assume that ecosystems' actors face risks that can be associated with uncertainty and reduced by coordination and learning. In tackling grand challenges, however, ecosystems are exposed to a larger degree of indeterminacy that cannot be controlled by probabilistic calculations and other customary patterns of industrial operation (Fritzsche 2010). They genuinely face the unknown (Elmquist et al. 2019), a situation that is well-characterised as strongly different in nature from uncertainty (Loch et al. 2006; Grandori 2023) and requires specific types of management (e.g., Gilain et al. 2023), which, amongst other things, can overthrow platform leaders (Thomas et al. 2021). In this context, power games in ecosystems require more attention (Ollila and Yström 2024). Furthermore, it is necessary to look at the specificities of heterarchical settings where there are multiple and possibly at first sight 'weak' actors (Müller-Seitz 2012), and at the dynamics of robustness and resilience on different layers of systemic operation (Maurer and Fritzsche 2023). Another potential scenario concerns the need to collaborate with actors that are unknown as of yet (Sydow and Müller-Seitz 2020; Barbier 2023) to address largely unknown new products and services required by grand challenges.

The pervasiveness of grand challenges tends to multiply the occurrence of situations where new manifestations of the unknown impact a manifold group of weak, loosely coordinated actors (Barbier et al. 2022), as can be exemplified in the archetypal case of recycling and cradle-to-cradle cases, where large parts of the 'recycling' ecosystem have to be redesigned, with 'weak' actors, with 'unknown' ones, working on largely 'unknown' services and products (Aggeri 1999). Of course, not all grand challenges require a complete redesign of ecosystems to face the unknown (Tarba et al. 2024). Platforms' ecosystems can often cope with grand challenges to a large degree (Ritala 2024). At the same time, surprising mechanisms of realignments are revealed in simple configurations of collaboration between a start-up and an incumbent firm, sometimes including the emergence of new orchestrators (Falcke et al. 2024).

It can therefore be concluded that research on the design and redesign of ecosystems in view of the unknown is urgently needed—and that there is a broad spectrum of different questions that need to be addressed.

2 | Special Issue Papers

The (re)design of ecosystems to tackle grand challenges involves critical societal issues, unique research questions and complex methodologies, and the special issue was developed acknowledging this. The five guest editors proposed a track on the topic at the 2019 R&D Management Conference at École Polytechnique, Paris, France. At that time, we received 21 high-quality submissions, followed by 19 in 2020 and 23 in 2021, totalling 63 submissions. Despite COVID-19 halting paper presentations in 2020, papers were still reviewed, and all authors received feedback. These successes led to this special issue, approved in July 2021 after a thorough review. Authors first submitted extended abstracts by December 2021, followed by full papers in Spring 2022. This process resulted in 21 submissions, culminating in the four papers featured here. As guest editors, we greatly valued the opportunity to collaborate with CIM editors, reviewers and authors. We extend our gratitude to everyone involved for their outstanding dedication and collective efforts to achieve excellent scientific outcomes. In Table 1, we summarise the four papers that were accepted for the special issue.

Barbier et al. (2025) address an extreme situation by asking how actors so far apart that they do not know each other and have no self-evident common interest can still begin to co-design an ecosystem fruitfully. How do we organise collaboration when actors do not know why and with whom they should collaborate? This strange situation emerges when actors of earth observation explore how satellite data could help face grand challenges in very diverse situations, where actors might not even know about satellite data, not to mention their ignorance of how to use it. The paper experiments with a so-called 'resilient-fit co-design' method and shows two intertwined effects: the resilient-fit co-design method supports a rigorous exploration of new products/services with high socio-economic and grand challenge–related impacts, and simultaneously it supports the creation of new collaborations. This 'co-design' method leads to the design of new services and the design of new 'co' (for collaborations), and more generally, it leads to the (re)design of ecosystems. In addition, a focal firm, a powerful orchestrator, does not lead this redesign process. It is led by an apparently 'minor' newcomer who supports the innovation of many players.

TABLE 1 | Summary of special issue articles.

Authors	Title	Empirical context	Method	Main result
Barbier et al. (2025)	Resilient-fit co-design methods: Designing the integration of Earth observation data into ecosystems facing grand challenges	Design of services based on satellite data	Multiple case studies	A class of 'resilient-fit' co-design methods that effectively foster collaborative innovation among actors with minimal common ground in situations of extreme disparity
Perez Mengual et al. (2024)	Physical interaction platforms: A taxonomy of spaces for interactive value creation	Living labs and innovation labs	Taxonomy development	A taxonomy for physical interaction platforms (PIP) covering physical architecture, platform actors, value propositions, value creation and revenue logic. Emphasises critical criteria that should be considered in the design phase
Nilsson and Ritzén (2024)	Manoeuvring responsive, tactical and preventive innovation in an innovation ecosystem addressing a grand challenge	Organised crime	Longitudinal study; single case study	Offers a model of how three interdependent and complimentary innovation processes (responsive, preventive and tactical) interlink. Introduces the concept of the 'bureaucratic poet' and its 'poetry skills'—the art of framing administrative rules to give public authorities the flexibility needed to fight crime. Innovations in ecosystems are inherently generative and may lead to spillovers across different contexts
Abadzhiev et al. (2024)	Exploring business model innovation for sustainability transitions: A case study in the wood construction industry	Wood construction industry	Single case study with multiple units of analysis; Gioia approach	Pursuing transformative business model innovation and blending value creation logic can help reduce uncertainty and steer business ecosystems toward sustainable opportunities. The business model is an organising tool to collectively explore knowledge, mitigate uncertainty and drive business ecosystem change

Perez Mengual et al. (2024) build on Ollila and Yström's (2020) concept of in-between spaces, studying physical interaction platforms (PIPs) as enablers of ecosystem operations. They characterise PIPs as physical places that bring together actors, enable and foster value creation through their interactions and orchestrate ecosystems by providing and enforcing rules. In contrast to digital platforms, PIPs encompass a broader range of social dynamics that arise from in-person interactions. Thus far, they have mainly been discussed as open laboratories in innovation research (e.g., Hu and Fritzsche 2021). Using the term PIPs, the authors emphasise the need for a broader context to fully capture their role in addressing grand challenges. Drawing on Nickerson et al. (2013), the authors follow a systematic taxonomy development process. They identify 18 dimensions that need to be considered when designing PIPs, grouped into five categories: physical architecture, platform actors, key value propositions, value creation ecosystems and governance and revenue logic. For each dimension, the authors describe different design options, laying out ample space for the design of PIPs. This not only enhances our understanding of existing open laboratories but also highlights unexplored design possibilities.

Nilsson and Ritzén's (2024) longitudinal study is informative in many ways. It provides valuable insights into addressing organised crime through a collaborative ecosystem of Swedish governmental authorities and related law enforcement organisations. The core challenge lies in tackling the opaque and unpredictable nature of organised crime, imbued by 'unknown unknowns.' Drilling deep into this setting, the authors emphasise the critical need for preventive measures, noting an unexpected disparity: while prevention is widely accepted as worthwhile in fields like healthcare or insurance, it is often dismissed as too costly in crime prevention. The study explores the interplay between responsive, preventive and tactical innovations, highlighting how these approaches collectively address crime. One key insight is the introduction of the 'bureaucratic poet' and its 'poetry skills,' which refers to the strategic framing of administrative rules to give public authorities the flexibility needed to manage unknown unknowns and adapt to evolving threats. The study also underscores the generative nature of innovation in ecosystems, spilling from one context to another. This highlights the intertwined nature of organisations and their activities, leaving room for in-between spaces (Ollila and Yström 2020), between organisational actors that tackle the challenges involved in crime by making problems actionable—an observation that resonates with Weick's (1988) concept of enactment.

Abadzhiev et al. (2024) show how the grand challenge of sustainability drove Stora Enso to develop a new business model, transitioning from traditional constructional wood to engineered construction wood—a radical shift challenging the centuries-old dominance of steel and concrete. Instead of supplying construction materials traditionally, the company collaborated with customers and third parties—contractors, architects, constructors, research institutes and regulators—to design system solutions, thereby (re)designing an entire wood-building ecosystem. The paper details how the company navigated this transition using business model tools. Analysing business model economics identified critical unknowns to address for sustainability. Examining business model actors enabled the company to redefine key partnerships, integrate downstream actors and utilise collaborative spaces where diverse ecosystem stakeholders could share knowledge and collaborate within a 'neutral environment'. The authors emphasise that the resulting ecosystem is a complex mix and superimposition of traditional and engineered construction wood. In this process, Stora Enso, a key player in the ecosystem, significantly contributes to its (re)design but does not lead or manage every detail. Instead, it relies on and benefits from collaborative spaces where multiple actors work together to navigate the unknown.

3 | The Design of Ecosystems as Creative Evolution

In our call for papers, we asked for a variety of theoretical approaches and empirical situations regarding how ecosystems can be (re)designed in light of grand challenges. Against this background, it is not surprising that we reaped what we had sown: the papers in this special issue deal with energy, organised crime, wind-energy–air quality, etc. As such, this rich empirical material is already a major contribution to the advancement of science in a field where few in-depth case studies were available—due to methodological obstacles created by the difficulty of exploring what does not yet exist, observing unknown or opaque actors and unknown actions.

The four papers elaborate extensively on the questions that gave birth to the special issue: How to manage the (re)design of ecosystems to face the unknown in grand challenges and, more specifically, how to manage the complex intertwined processes that lead to exploring both new products/services associated with grand challenges and new collaborations in ecosystems, enabling the commitment of new players in new partnerships.

The responses given to these questions in each individual paper are already highly informative and hold important implications for theory development and application. The juxtaposition of the papers in the special issue allows us, furthermore, to draw conclusions regarding the treatment of the unknown in the (re)design of ecosystems, responding to the gap in research highlighted before. Here, the key issue is to understand how actors can address indeterminacy in the unknown not as an obstacle, but instead as an opportunity to embrace generativity. To show how this is achieved in the context of each paper, we focus on three different facets of the issue (overview provided in Table 2) and identify how they are addressed:

A. The *logics* of collaboration between actors in the unknown to (re)design their ecosystem

B. The *forms* of value creation and value capture in these situations

C. The *methods* used to organise autonomous actors in the unknown

A. Logics of collaboration between autonomous actors in the unknown—generativity enhancing

One aspect revealed by all four papers is the observation that there are not necessarily focal actors requiring consideration. Instead, the papers show that actors in multiple constellations might act as catalysts. In this role, they enable other organisations, which is why we presume that it might be worth speaking of 'generativity enhancers' in this context. Hence, we refer to organising actors that might take many shapes, not only that of a focal, for-profit firm, as is most researched in inquiries about business ecosystems. The papers show that, in this context, there may also be constellations without a single, clear 'owner'. This idiosyncratic constellation of organisations and/or individuals can support exploration-related activities. These actors are not necessarily focal, in the sense that they do not guide or prescribe actions and do not impose their will on other actors in the business ecosystem. It is rather that their real 'generative power', their capacity to support the generativity of the whole ecosystem—is reminiscent of the 'architects of the unknown' (Agogué et al. 2013, 2017), 'colleges of the unknown' (Le Masson et al. 2012) or the managing of 'in-between space' (Ollila and Yström 2020, 2025). Note that this generativity goes beyond the combinatorial generativity described in Zittrain (2006) to encompass the emergence of new values, new techniques and, more generally, expansions (Hatchuel 2002). Moreover, as in the case of tackling organised crime, actors might remain by and large unknown (i.e., criminals), nonetheless contributing to the emergence of collaboration across actors (i.e., public authorities engaged in tackling crimes).

The papers clarify the possible properties of these actors:

i. The role they play: Actors facilitate generativity—not necessarily by having all the ideas and solutions by themselves, but by being able to support generativity, hence, enabling others to thrive. This idea surfaces vividly in the paper by Abadzhiev et al. 2024 [Correction added on 18 November 2025, after first online publication: In section "3 - The Design of Ecosystems as Creative Evolution", all instances of "Sukhov et al" have been updated to "Abadzhiev et al" in this version.] which describes the support of the inventiveness of the architect or other constructors. Along similar lines, Barbier and colleagues relate to the ingenuity of data users and the paper by Nilsson and colleagues identifies new forms of action by several players, whereas Perez et al. propose places for others to innovate.

ii. The coordination mechanism: Considering this, there seems to be a key difference to what is commonly perceived as being a broker (Burt 1992), where the broker just assures coordination between buyers and sellers of a 'known' product, service or knowledge to be exchanged. Here, the generativity enhancer helps other actors to jointly generate original alternatives to cope with encounters with the unknown in facing grand challenges. This holds even more true in cases where participants can be unknown themselves, without the buyer/seller relationship (see Barbier et al. 2025) or the lack of any intention to collaborate (see Nilsson and Ritzén 2024).

iii. Furthermore, a link can be drawn to the origins of the term 'ecosystem', referring to an open system structure that relies on self-organisation to maintain an equilibrate state (Chapin et al. 2011). (Re)design, as illustrated in the publications of this special issue, can be a radical intervention, setting the stage for interaction and providing the means that are available to innovate (Perez Mengual et al. 2024) or to do business (Abadzhiev et al. 2024). This way, (re)design sets the conditions under which members of the ecosystem can constitute themselves as actors and exchange with others.

B. Forms of value creation and value capture—creative preservation

Confronted by grand challenges, the ecosystems studied in the articles presented here are evolving and integrating new values, associated with the Sustainable Development Goals put forward by the United Nations. There is a clear notion of value creation at the global ecosystem level (e.g., value for construction wood sustainability in Abadzhiev et al. 2024 value of the services created through co-design workshops in Barbier et al., values of a safer society in Nilsson and Ritzén 2024).

It is also evident that in these cases, added value is created, but that this is superimposed on value preservation: in the paper by Abadzhiev et al. 2024 the 'traditional' construction wood is preserved, not destroyed; in Barbier et al., past services are enhanced and enriched by satellite data, not destroyed; in Nilsson et al., past methods are not negatively impacted by innovative coordination and the actors develop a capacity for 'bureaucratic poetry', meaning that they keep the bureaucratic rules and at the same time find ways to interpret the rules to support new forms of action. In these cases, the logic of development and innovation is not a creative destruction (Schumpeter 1939) but a creative preservation (Le Masson et al. 2023); this is more a redesign or a renovative, regenerative design than a disruptive design. Equilibria of systemic operations are allowed to float; they are not destroyed.

C. Methods to organise autonomous actors in the unknown—creating multiple local design spaces

As expected in the call for papers, the contributions to research in this special issue put clear emphasis on how the actors manage the (re)design process. Additionally, we see here a kind of contrast between the expected impact at the ecosystem level (i.e., an impact spreading in breadth and depth in the whole ecosystem) and the relative modesty of the means and power of the organiser (the generativity enhancer). This contrast is visible in Barbier et al. in the resilient-fit co-design, since each workshop leads to creating multiple local actions at many places in the ecosystem and with multiple time horizons. In Abadzhiev et al. 2024 multiple 'small' actions, driven by business model innovation, set the whole complex ecosystem in motion progressively. In Nilsson et al., the logic of bureaucratic poetry is a management logic that has both the systematic power of bureaucratic rules, valid in a whole ecosystem, and the innovation capacity for local manoeuvring to adapt and so to fight the quick evolutions of organised crime. In *Physical Interaction Platforms*, Perez Mengual et al. describe local places where actors develop solutions interactively that are ultimately valid for each of the players participating in the process. The methods used by generativity enhancers appear minimalist yet broad, requiring the creation of multiple local design spaces addressing locally the global presence of the unknown in grand challenges. Even if it is a 'grand challenge', this is not a 'grand project' (Mazzucato 2018): the method used in the redesign of the ecosystem by generativity enhancers leads to

TABLE 2 | An overview of how the papers contribute to addressing the facets.

Authors	Title	A) Logics of collaboration between autonomous actors in the unknown—generativity enhancing	B) Forms of value creation and value capture—creative preservation	C) Methods to organise autonomous actors in the unknown—creating multiple local design spaces
Barbier et al. (2025)	Resilient-fit co-design methods: designing the integration of Earth observation data into ecosystems facing grand challenges	Involve unknown, distant users in a co-design process, provide the coordination mechanism for that	A process that helps to use new resources (satellite data) to design for grand challenges	Resilient-fit co-design, a new method to enable people to design together despite 'long distance'
Perez Mengual et al. (2024)	Physical interaction platforms: A taxonomy of spaces for interactive value creation	Differentiation of scenarios of collaboration; physical interaction spaces for innovation. Showing the breadth of possibilities to engage with others	Enlarging the degrees of freedom to work on grand challenges, allowing better planning of shared activities	The paper provides decision-makers with decision criteria to choose the PIP model relevant for a particular situation of 'ecosystem confronted by grand challenge'
Nilsson and Ritzén (2024)	Manoeuvring responsive, tactical and preventive innovation in an innovation ecosystem addressing a grand challenge	Instead of a centralised crime agency doing all the activities, innovation emerges from different authorities that join forces	The value provided is immaterial, security—a 'non-eventful' value as the value only exists if individuals, organisations and society as a whole continue to exist without being harmed or suffering less from organised crime	'Bureaucratic poetry' to keep degrees of interpretation in administrative rules
Abadzhiev et al. (2024)	Exploring business model innovation for sustainability transitions: A case study in the wood construction industry	A 'local' leader prompts innovation along the whole value chain, using new or existing collaboration spaces	Lead to more sustainable construction—preserve and expand construction wood	Use business models to identify the unknowns that are critical for economics sustainability and to identify key partnerships

multiple, loosely related projects. The generativity enhancer creates the capacity to accumulate, rebound, create a sequence of projects and extend to bigger actions by launching new projects with new partners. It is more like a metabolic movement comprising multiple complex interactions and operations more or less autonomous or only loosely related. This leads to the effect of apparently 'small' projects and yet broad and deep propagation; apparently 'red tape', bureaucratic actions and yet creative ones; apparently local and yet impacting on grand challenges. Single actions can have a strong lever or pervasive effect: they appear to create only 'small changes', but the actions circulate horizontally between partners (e.g., diffusion in Combient Pure in Abadzhiev et al. 2024) and vertically (e.g., local action finally provokes a change in the whole ecosystem in Abadzhiev et al. 2024).

TABLE 3 | A contrast of two extreme cases of (re)design of ecosystems.

Two extreme models of (re)design of ecosystems	Without the constructs (no generativity enhancing; no creative preservation; no new, local design spaces)	With generativity enhancing, with creative preservation, with new local and distributed design spaces
Generativity enhancer?	No—actors optimise their usual competitive performance or push their own innovation	Yes—some actors support the generativity efforts of others (ideas for others, defixation for others...)
Creative preservation?	No—actors favour creative destruction (disruptive innovation) or no innovation (tradition)	Yes—some actors create to preserve (preserve value, resources, law...)
Methods to get multiple local design spaces	No—methods and processes rely on existing design spaces (e.g., existing niches)	Yes—methods help to create new design spaces (local projects, new niches...)
Dynamics of the (re)design of the ecosystem	Selection process of existing innovative actors, competition between tradition and innovators Leading to either conservatism (innovators lose) or disruption (tradition is lost) Niche selection	Multiple local, distributed, loosely coupled innovative actions; new collaborations based on creative preservation Leading to multiple ecosystem development paths, each one combining tradition and innovation. Niche emergence; new symbiosis
Socio-political, political impact in front of grand challenges	Risk of fixation or predefined ideas, limited collective learning processes; socio-political tensions (sacrificial dilemmas) created by grand challenges	Multiple loosely coordinated learning, overcome fixations; socio-political complexity characterised by regular emergence of surprising alternatives to face grand challenge; resilient

3.1 | Tentative Theoretical Contribution—Model of Creative Evolution?

The papers led to the identification of three pivotal constructs in what we call a model of creative evolution: (A) 'generativity enhancer' as a critical type of action/actor in the redesign of the ecosystem; (B) creative preservation as a critical factor shaping the performance; and (C) necessary methods for creating/sparing effective multiple local design spaces. These constructs can be considered factors to characterise the (re)design of an ecosystem—they enable the characterisation of multiple dynamics for the (re)design of ecosystems (always: without a focal firm), depending on the intensity of each of our three constructs.

To illustrate the novelty of the constructs, Table 3 below contrasts two extreme cases: ecosystem (re)design without any of the three constructs and ecosystem (re)design in the presence of all three constructs. The first one (without) tends to correspond to a well-known niche selection process, whereas the second one leads to less predictable, more synergistic, more resilient and more dynamic (re)design of ecosystems in front of grand challenges.

4 | Implications and Future Perspectives

4.1 | Theoretical Implications—Conceptualising Creative Evolution

The papers assembled in this special issue paint a highly original picture of the (re)design of ecosystems. Between the logic of planned transformation (led by focal firms orchestrating change or platform leaders enabling and controlling local innovation by complementors) and the logic of niche entrepreneurs who would overthrow the old innovation regimes (Schot and Geels 2008) according to an evolutionary logic, the papers show how the management techniques of generativity enhancers can lead to a hybrid logic in the (re)design of ecosystems that we can call creative evolution.

In evolution, mutation and selection act in every niche of an ecosystem, leading to competition (and even forms of symbiosis)—this is a very old perspective on economics, which can be traced back to the works (and debates) of Spencer and Dyer (1895), to evolutionary economics (e.g., Nelson and Winter 1982) and to evolutionary technological transition (e.g., Geels 2002). This evolutionary logic is at work in the four cases, in the sense that every actor lives in a world of fierce competition (even the multiple administrative departments fighting crimes in Nilsson et al.). On the other hand, managerial action tends to create new structures in a way that is decidedly different from evolutionary change and aims at a planned transformation. This managerial logic is also present in these cases: the papers describe how some actors, generativity enhancers, in tackling grand challenges, establish new collaborations in the ecosystem that allow for new collective rational action, exploring logics of creative preservation, beyond the fixations of tradition and beyond the fixations of disruptive creative destruction. Depending on the focus that is set by the generativity enhancer, different degrees of freedom emerge to create value through creative preservation. It is as if the methods of the generativity enhancer modify the mutation-selection process, for instance, by connecting niches or giving access to new resources (e.g., new knowledge or new collaborations), triggering new symbiosis or even creating new niches. This 'creation' logic combines with the 'evolution' logic into a 'creative evolution' that enables a curious (re)design of ecosystems in face of grand challenges.

Summing up, our idea of how ecosystems might be subject to (re)design to face grand challenges extends existing conceptions of how ecosystems are to be managed. Table 4 compares the traditional perspectives on how ecosystems unfold with our ideas on creative evolution, which also allows for decentralised and emergent, sometimes even hidden actors that constitute the ecosystem and have mostly been left out of the debates so far. Toward this end, despite the contrasting description in the table, we do not assume both conceptions to be opposites. Instead, we view them as being a continuum in reality. However, for theory-building purposes, we feel that this juxtaposition helps to underscore our underlying idea.

4.2 | Managerial Implications and Outlook

These papers and the model it inspires have clear implications for practice on two levels: on the level of individual actors, it provides methods to become a generativity enhancer that is open to big or small actors, that defixate beyond its usual stakeholders and create multiple new niches and symbiosis—it provides elements for a new strategic intention (creative preservation), based on a new action logic (enhance the generativity of multiple actors) with local methods. This is certainly a way to deal with ecosystem evolution that is different from usual 'selective' competition.

On a more socio-political level, this logic could be supported by incentives or training logics (e.g., train 'generativity enhancers', support the diffusion of methods such as co-design methods); it could also call for new regulatory approaches to support this type of actor (e.g., new firm governance based on 'mission';

TABLE 4 | Comparing traditional perspective of ecosystem (re)design vs. creative evolution.

	Traditional perspective	Creative evolution
Rationale of actors	Optimisation/maximisation	Opportunity generation
Distribution of power	Uneven	Even or varying
Ambitions of key actors	Taking advantage	Generativity enhancer
Innovation logic	Creative destruction	Creative preservation
Visibility of actors	Given	Given, but also unforeseeable

Levillain et al. 2023) and to support solidarity and risk sharing between generativity enhancers.

To summarise, the special issue studies the (re)design of ecosystems in light of grand challenges by specifically focusing on a) management techniques b) in complex ecosystems without focal firms or platform leaders, c) facing grand challenges requiring the exploration of the unknown. The contributions draw attention to the role of a generativity enhancer who manages new coordination and exploration locally, which both create new value streams and preserve past ones. The resulting process can be characterised as a 'creative evolution' in that it is not a fully deterministic creation nor a fully evolutionary process but a surprising combination of the two.

We therefore believe that this special issue can also generate more value than the sum of its parts, alongside the aforementioned paths of concept development and practical recommendations.

a. It opens the door to a frugal management of transition, which is neither the unmanaged selection of the fittest nor the illusory planned, deterministic, synoptic transition.
b. It elaborates on specific, restrictive conditions of ecosystem (re)design—but these conditions might eventually prove to be quite common, since it is typical for grand challenges to weaken the orchestration power of incumbents and threaten to overthrow well-established platform leaders.
c. It gives first insight into the critical methods and competences required to manage a creative evolution, as introduced in this editorial.

We hope that the readers of these papers will enjoy them as much as we did and that their reading will inspire their research projects to criticise, deepen, sophisticate and extend the logic of creative evolution for the (re)design of ecosystems to face grand challenges.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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