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**Generating Solutions to Systemic Risks  
through On-Going Experimentation  
on Invested Space-Forms**



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# Generating Solutions to Systemic Risks through On-going Experimentation on Invested Space<sup>forms</sup>

## Abstract

We live in a complex dynamic world where human activities interfere with the environment in intricate ways causing unpredictable natural events with extreme outcomes that affect vulnerable societies. It reflects exposures to *uncertainty* and *unknown* factors as opposed to risk, which is measurable. We tend to downplay concerns that are hard to measure but have exposures to more uncertainties than we realize. We can try to assess potential extreme events and ways to mitigate their adverse effects, but that fails to address the underlying causes rooted in the way we organize global economic activities. The local exposures derive from the way society governs its economic assets whereas the systemic effects derive from global business practices that generate economic value. The exposures are local while the systemic causes are global. Mitigating local risks does not reduce the global systemic effects. Sustainable solutions must involve business entities that operate the global economy. The extreme uncertainty of systemic risks makes grand solutions untenable where viable solutions only can derive from distributed experimentation and collaborative learning. Hence, we must embrace uncertainty and explore for opportunities engaging committed enterprises in the quest for long-term solutions. Current practices often allocate resources to address acute threats but fail to invest in exploration for new opportunities. This can be accomplished if private, public, and plural sector stakeholders invest in joint platforms (Space<sup>Forms</sup>) that foster creative solutions honing their collective intelligence. Performing guided probes and learning from them as they evolve is a viable approach to generate sustainable solutions for global systemic issues that need collective responses.

Key words: Complexity; Disasters; Extreme events; Innovation options; Platforms; Space<sup>Form</sup>; Strategic renewal; Sustainable solutions.

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## Introduction

Major risk incidents seem to increase in number and intensity including extreme weather events, water and food restrictions, economic crises, cybercrime, political conflicts, pandemics, etc. (e.g., World Economic Forum, 2019, 2020, 2021). While these events have an impact on general economic activities, they hit disproportionately hard on vulnerable developing countries. Yet, the underlying causes largely derive from systemic issues like climate change, global business practices, international politics, and social mechanisms beyond the control of local societies and individual institutions. These economic exposures increase as populations grow and productive assets increase and agglomerate around major cities often in more exposed vulnerable areas. The adverse outcomes of potential disaster events affect the people, organizations, and societies alike as an evolving reality that challenges the ambitious goals to protect the planet and gain sustainable prosperity that reduce poverty by 2030 through the active engagement of corporations and public entities (United Nations, 2015). Whereas, multilateral aid typically has been forthcoming to support suffering regions when local environmental crises occur, these sources are becoming scarce when economies and societies are affected simultaneously by disaster-like phenomena, e.g., pandemics like Covid-19 or extreme effects of climate change. As this kind of economic relief is unlikely to be forthcoming in sufficient amounts there is a need to consider alternative financial arrangements and investment vehicles that can generate future solutions through collaboration between public, private, and plural organizations that all are affected by the same global systemic phenomena. Hence, we must solicit financing from these central players and engage them in open collaborative exploratory search for innovative solutions where current investments often pursue projects that all pretend to have the solution in a public betting process.

We observe increasing economic exposures to extreme natural phenomena in particularly vulnerable societies caused by risk factors that are beyond their control and engage in applaudable efforts to analyze the effects of potentially extreme events and assess possible ways to mitigate their adverse impacts. However, that does not address the underlying risk factors that are rooted in the way we have organized global economic activities through wasteful use of energy sources adopting business practices that pollute the environment and have long-term climatic effects. The exposures on local economic assets relate to the way the local society governs them and thereby affect their vulnerability whereas the underlying systemic effects derive from global business practices that are beyond the influence of local actors. Hence, attempts to mitigate local exposures, no matter how well intended and effective they are, do not address or reduce the global systemic effects that trigger the extreme local events. Since the root- cause to these events are associated with the way we, in general, conduct global economic activities to create value for our societies, the generation of sustainable solutions must involve the business entities that operate those economic activities around the world, it cannot be accomplished purely through public intervention. Public, multilateral, and plural sector institutions provide important governance frameworks and expertise to deal with the issues of systemic risks, but private enterprises must deliver on new viable business approaches and thus constitute essential players in the execution of sustainable solutions.

Adopting conventional control-based risk management approaches to deal with significant societal exposures to global systemic risks in attempts to analyze and mitigate the effects of potentially extreme local risk events will not by themselves be able to deliver long-term viable

solutions that counter the basic causes for the extreme events. It reflects a normal tendency to look at local conditions, which indeed might be useful, but nonetheless fails to address the underlying factors that create the systemic risks that are way beyond the local contexts and relate to the common way economic agents operate around the world. Hence, there is a tendency to commit scarce resources to remedy (deficient) operations and improve the status quo where there is a need to consider the root causes of the systemic risks and invest in experimentation that can find entirely new sustainable approaches that reduce them. There is a tendency to consider and model the elusive contours of the systemic risks imposed by a dynamic complex system that is hard to quantify and outline in any meaningfully predictive way. It is not possible to describe the concrete future risk events in detail for practical planning purposes but we can provide dire predictions of eventual and potentially fatal outcomes for humanity that may change the way we currently live our lives. The elusive ability to describe the emergent effects from potential extreme risk events also means that it becomes harder to focus on, and conceive of, potential solutions and engage in concrete hands-on efforts to countervail the extreme events. For example, the potential for pandemic incidents was included in the 2019-2020 Global Risks Reports although as less likely events with medium economic impacts and it only rose to high impact high likelihood status in 2021 after Covid-19 had become a fact (World Economic Forum, 2019, 2020, 2021). All the while, the environmental factors that figured prominently before 2021 were toned down somewhat in the wake of the Covid-19 pandemic reflecting (most likely) that human attention is influenced by the immediacy of events rather than truly objective assessments of future developments. Hence, the ability to foresee and respond effectively to emergent extreme events seems rather wanting in practice.

The world is turbulent and things often change abruptly in unpredictable ways with potentially extreme outcomes. Some argue that the risk landscape is changing toward more uncertain and unpredictable conditions that require unconventional ways to deal with major exposures in complex dynamic settings. These conditions can lead to poly- synchronous incidents where many simultaneous disruptions, or events, arise at the same time in linked systems and related sub-systems. It requires that we make a distinction between risk (as *measurable uncertainty*), true uncertainty (*unquantifiable exposures*), and the unknown (*unpredictable* or *unexpected* events) where we, as humans, subconsciously rely on the risk concept without thinking about it. We tend to close our eyes to, or at least pay less attention to, issues that are hard to measure and thereby in reality subdue them and thereby in effect behave as if they do not exist. This seems to be the case with systemic risks, the effects of which defy any simple description. Distant events, that are hard to conceive of, are often (subconsciously) dismissed, or postponed, or approached as if they are measurable uncertainty to be plotted into an impact-likelihood chart that makes us feel more in control. We attempt to manage risk, e.g., systemic risk, where we in reality are exposed to extreme uncertainty, unpredictable events, and unknown conditions that we have a hard time getting to grips with. In this satiation, we must embrace the uncertainty and try use the opportunities new circumstances may offer and prepare for ways to exploit them in viable solutions that change the way we currently conduct business in the global economy. Since it is difficult, or virtually impossible, to develop comprehensive planned activities to deal with these highly complex systemic issues there is a need to explore for new responses by conducting many small probing initiatives in search for viable future solutions. This will engage diverse institutions in collaborative exploratory efforts as a more viable approach as opposed to irreversibly committing to a grand solution that is unrealistic. Ongoing experimentation and learning along the way is the viable approach to reach at sustainable solutions for the future.

Systemic risk events, e.g., arising from degrading business practices, can be sudden and unexpected where the likelihood of occurrence can build up through time in the absence of appropriate responses. However, modelling the systemic risk behavior of complex dynamic systems is intrinsically difficult as implied by the definition of true uncertainty as unquantifiable exposures. The networked world of anthropogenic systems that operate within a highly complex natural system can be unstable and uncontrollable, and it is not possible to fully understand everything in detail in advance. The related systemic risks that derive from this environmental context are often expressed as downside exposures reflected in potential loss scenarios. In contrast, risk governance (at least in principle) constitutes the processes and mechanisms whereby updated information is assembled, analyzed, and communicated to various actors for decision-making and responsive actions (also) considering how to benefit from upside potential of opportunities while minimizing the downside losses. To accomplish this may require more organic structures in collaborative public-private arrangements that can address the complex systemic challenges by honing the collective intelligence of many individuals, organizations, and institutions to generate viable solutions in pursuit of common goals and benefits for society and humanity.

The following characterizes the risk landscape and considers structural and processual requirements to deal with the uncertain and unknown conditions where unpredictable and potentially extreme events is the new normal. This complex dynamic context cannot be contained employing conventional control-based management approaches but requires conscious investments in exploration. A look across organizational studies and insights from the (strategic) management field outlines approaches to guided exploration where portfolios of strategic innovation options can uncover viable practices and capabilities in collaborative creative interactions. This introduces the formation of a next generation platform, or Space<sup>Form</sup>, as an effective investment vehicle for collaborative exploration to generate sustainable solutions for major societal challenges.

## The emerging risk environment

Globally connected organizations with social links between individuals across borders with broad commercial, financial, and information flows facilitated by digital technologies with exponentially increasing capacity contributes to create a high level of complexity and uncertainty in the global socio-economic environment. It can be perceived as a complex dynamic system comprised by many interacting agents and entities where eventual outcomes defeat simple comprehension because the behavior of each of the component parts depends on the behavior of the others. The effects are nonlinear and cannot be derived from simple aggregation of individual behaviors. Events follow irreversible paths where decisions are made along the way and partially determine the subsequent options available for future actions. Hence, it is not really possible to forecast developments as things are intertwined in intricate relationships of interacting networked elements where things in one place can have unexpected consequences elsewhere in the system. It is difficult to foresee future developments, but it is possible to investigate relationships between the systemic parts and effects on collective outcomes. This again defeats the ability to generate grand plans as viable responses to systemic risks and rather points towards emergent exploration as the viable approach to generate sustainable solutions.

The introduction of the Black Swan phenomenon reflects nothing more than the observance of extreme events as an essential aspect of contemporary life (e.g., Taleb, 2007, 2013), which

we humans often tend to ignore. This is partially because randomness and extreme deviations contravene the norms of scientific approaches that tend to depend on large-scale repeatable analyses as the basis to create reliable predictive relationships. Yet, rare and improbable events prevail and exert more influence than we normally realize and may be particularly impactful for the very reason that they appear to be unexpected. The heuristics of humans attempt to make shortcuts to react fast under pressure by extrapolating from prior experiences to future events and scenarios although what appears to be known may be an illusion as the environment changes in new ways that diverge from the past. This displays the shortcomings of diagnostic control processes in contexts where the underlying assumptions about the environment as well as the very rules of game are changing.

This means that dependence on rational analysis based on data driven quantification to stipulate potential exposures based on specific risk probability distributions is challenged. Instead, the risk events must be conceived as social multilevel phenomena that are subjective in their interpretation and hard to quantify based on current perceptions and learning responses. The risk environment is becoming more complex and dynamic implying many largely unpredictable traits with respect to emergent developments in the environment where individuals must guide their actions by ethical considerations in open flexible organic structures. Hence, some argue that we are moving from contexts characterized by actuarially predictable risks towards true uncertain conditions affected by many a priori unknown factors (e.g., Andersen & Young, 2020).

Extreme events are often international in scope where effects cross the national borders in self-reinforcing global systemic effects (Smith & Fischbacher, 2009) as observed in, e.g., financial crises, climatic effects, and pandemics. The underlying socio-economic exposures lack prior observable evidence that could make them predictable, so the final scale and form of outcomes is largely unknown. These types of events have a potential to trigger major hazards, disasters, and crises as conventional analytical techniques and control frameworks fall short. The risk landscape is changing from a modernist to a post-modernist context (Miller, 2009). However, the complex dynamic systems can uncover unexpected opportunities from innovative and creative initiatives that come about in unpredictable ways as potential sources to future solutions. Complex adaptive systems are special cases where engaged agents show a capacity to uncover and try new approaches by learning from these experiences in ways that eventually allow the organization to adapt to the changing context.

## Resilience, agility and adaptation

Resilient organizations are effective in dealing with emergent events and are able to take quick actions as incidents arise and evolve, but this requires more than standard procedures. Resilience in organizations, and social systems in general, thrives on perceptual support, individual commitment, active involvement, innovation, creativity, autonomy, capabilities, available resources, structural flexibility, continuity, renewal, and recovery in the face of extreme changes (Kantur & Isery-Say, 2012). In an organizational setting things are influenced by the decision-making structure, information processing systems, individual motivation, and incentives. Operating in complex dynamic systems can generate unexpected effects that defeat common practices specifically with respect to low-probability high-impact events. This also implies that the upside potential from emergent opportunities can derive from unexpected exploratory efforts in resilient organizational or social contexts (e.g., Taleb & Goldstein, 2012).

Resilience can be described adjusting to challenging conditions, so the organization emerges stronger and more resourceful than before the inflicting disturbances, shocks, and extreme events occurred reflecting an ability to face disruptions and deal with unexpected events (Annarelli & Nonino, 2016; Vogus & Sutcliffe, 2007). The social mechanics of resilient processes are linked to individual beliefs and cognition where past success is treated lightly with a high awareness about the potential for unexpected events that regularly test the prevailing assumptions we normally ascribed to good performance. Resilience relies on structures, processes, and practices with effective response capabilities when the organization, or society, is under strain. At the individual level this entails values, emotional stability, self-efficacy, reflective thinking, prosocial behaviors, participation, encouragement, and high expectations (Abdullah, Noor & Ibrahim, 2013).

In the face of true uncertainty where all possible courses of action as well as potential outcomes are indeterminate, organizations and social systems in general are better off when they act through interdependent processes of *causation* and *effectuation* (Packard, Clark & Klein, 2017). Learning by doing as things emerge and evolve. A causal approach implies engagement in preliminary conceptual thinking to outline possible states going forward and consider alternative opportunities to achieve expected optimal outcomes. An effectual approach implies that opportunities are derived from available resources and applied on an ongoing basis when emerging outcomes are seen to deliver tenable and desired outcomes. In terms of systemic risks, this implies that attempts to make predictive and consequential analyses of future scenarios and extreme events is a useful preceding sense making exercise that may inform and inspire the ongoing exploration processes.

When organizations and societies confront adverse socio-economic conditions caused by extreme environmental events, they often follow a specific recovery process. It typically entails a first attempt to increase the efficiency of existing processes, retrenching assets, and focusing on core activities to safeguard the future. The recovery plan is often accompanied by efforts to reinvigorate leadership with stated attempts to change the organizational culture and challenge old routines suggesting new ways to do things (Shoenberg, Collier & Bowman, 2013). While this is an observed pattern in organizational recovery efforts, it might not present the most effective approach. Hence, it has been observed how organizations achieve faster recovery when they respond within a network of institutional partners (Scoot, Laws & Prideaux, 2008; Silber, Israeli, Bustin & Zvi, 2009).

## Dealing with wicked problems

Conventional decision-making models assume reasonable stability around tasks and organizational design parameters where decision-makers often face unprecedented interdependencies of unpredictable factors or forces embedded in complex wicked problems. A wicked problem is difficult (or impossible) to resolve due to incomplete and at times contradictory information and frequent changes in requirements and output functions in a turbulent context. It refers to an issue that cannot be fixed but constitutes a moving target without a single (simple) solution where the term wicked denotes resistance to resolution, rather than evil. In organizational, social, and societal settings, it refers to issues with a high level of complexity without any determinable final point of stability. In fact, it displays many of the characteristics that can be ascribed to systemic risks. Due to highly complex dependencies between many moving elements, the resolution to one aspect of the (wicked) problem may create other problems elsewhere in the complex dynamic system. Hence, the

ability to deal with wicked problems in social systems require cross-functional and collective processes induced by supportive values and leadership principles. The development of IT-based decision support systems may facilitate the collaborative processes although automated digital systems are rendered ineffectual against the extreme complexity of wicked problem. Hence, there is a need for alternative methodologies to deal with contemporary wicked contexts that combine many individuals using communication technologies to exchange feedback across multiple stakeholders as people (and groups) participate to assess responses and expected outcomes. Collaboration between multiple diverse stakeholders can improve the ability to generate solutions to wicked problems and evaluate dynamic outcomes of strategic moves under uncertain and continuously changing conditions.

Various fields of study have analyzed the effects of environmental disruptions as they affect current operations and business conditions in general. Major events can disrupt essential elements of global value chains, and cause changes in prevailing economic structures with significant effects on strategic outcomes. Operational flexibility in sourcing and distribution choices can allow dynamic adjustments to the location of production, sourcing, and selling activities and these built-in flexibilities can consider the speed of design, volume changes, workforce restructuring, etc. These approaches point towards need for a central function to think through, structure, and organize built-in flexibilities whereas the dynamic adaptive handling of the operating structure demands dispersed response capabilities. Hence, operations management studies note that central coordination combined with decentralized information sharing across multiple option structures is superior in dealing with unpredictable conditions (Datta & Christopher, 2011). This resonates with and underscores the need for interactive causation and effectuation processes to deal effectively with complex adaptive requirements imposed on the global value chains that constitute the productive infrastructure for the global economic activities.

## The emergence of effective strategic responses

In organization theory decentralization and delegation of decision power is proposed to deal with uncertain conditions allowing dispersed operating managers who possess the detailed situational and task related insights and knowledge to make faster and better informed decisions (Child & McGrath, 2001). However, decentralization is an insufficient remedy as structural regularities matter as well including the importance of flexible, robust, and adaptive operating structures combined with central integration and analytical competencies. Ambidextrous organizations can exploit the capabilities of the existing business model and at the same time explore for opportunities that can adapt the business model with required capabilities when there is a need to execute adaptive moves (Junni, Sarala, Taras & Tarba, 2013). However, the literature presents two strands of organizational ambidexterity that compete for attention. The emphasis on *structural ambidexterity* argues that explorative efforts must be separate from the current business activities to be free of potential pressures from prevailing operating norms (e.g., O'Reilly & Tushman, 2013). In contrast, the *contextual ambidexterity* view argues that ongoing innovative changes must be informed by insights from the current activities to ensure relevance (e.g., Birkinshaw & Gibson, 2004; Raisch, Birkinshaw, Probst & Tushman, 2009). While this issue remains outstanding, we argue that the adoption of a Space<sup>Form</sup> approach to jointly explore for new solutions on a separate but common platform is a simple and effective way to resolve the conundrum, which will become clear as we proceed.

The strategy field has long been cognizant of the fact that realized outcomes derive as the result of both intended, or pre-planned, actions as well as emergent actions taken along the way as opportunities arise (Mintzberg & Waters, 1985). Hence, organizations with successful strategic renewal trajectories allocate resources as centrally induced investments, but at the same time allocate a substantial part of their development activities to autonomous initiatives (Burgelman & Grove, 2007). Organizations that are effective in combining centralized intended processes with decentralized autonomous initiatives generally outperform their peers and display favorable risk-return profiles over time (e.g., Andersen, 2010; Andersen, Denrell & Bettis, 2007). The central coordination of activities advances a better understanding of complex environmental relationships while decentralized initiatives generate exploratory responses that uncover potential solutions. Similar approaches to agile innovation have been applied in product development and strategic-planning processes exposed to complex wicked problems with unknown solutions (Rigby, Sutherland & Takeuchi, 2016). This has obvious ramifications for the way we should deal with systemic risks as wicked problems. That is, grand analytical solutions are not viable in and of themselves but can provide useful insights to guide dispersed autonomous exploratory processes in search for partial solutions that can be integrated into coevolving production structures through open collaborative efforts.

## Solutions through dispersed engagement

Members internal to the organization, and local stakeholders they interact with, can be engaged to deal more effectively with emergent and unexpected circumstances using the deep location-specific insights they possess with their close ties to various market actors to enhance the understanding of the situational context (Aaltonen, Kujala, Lehtonen & Ruuska, 2010). Maintaining strong and close relationships to essential stakeholders can become essential in dealing with uncertain and unforeseen conditions (De Mayer, Loch & Pich, 2002) by providing a collaborative search across relevant experiences to generate viable solutions. The access to broader experiential insights from multiple sources can be extended by applying communication and information technologies that incorporate artificial intelligence solutions to empower and engage local actors.

An emphasis on environmentally sustainable business practices can contribute to organizational resilience by helping individuals increase the awareness of emergent environmental changes and seize possible long-term solutions to deal with emergent threats (Ortiz-de-Mandojana & Bansal, 2015). This can help organizations uncover otherwise unobserved threats and opportunities and thereby increase the ability to address pending environmental issues in a timely and effective manner. Corporate responsible behavior can further build reputational assets and increase trust as a reliable counterpart where imbedded stakeholder relationships can be levered to deal with complex social issues (Andersen, 2017).

In short, when organizations and societies are confronting wicked problems that apply to contemporary complex dynamic environments, the ability to derive collaborative solutions from open interactive discussions between causation (forward-looking analytical reasoning) and effectuation (insights from ongoing experimentation) is part of the prescriptive approach.

## Public, private, and plural sector catalysts

The challenge then is how to devise proper structures to establish an effective adaptive dynamic involving multilateral and public institutions as proponent for proper governance but also, and not least, private enterprises that provide and manage the global economic

infrastructure that must change to create sustainable solutions. Organizations can develop strategy through *causation*, which entails conceptual and analytical thinking that rationalizes conscious strategic choices considering alternative paths to achieve the initially stated aims. In contrast, strategy developed through *effectuation* engages in concrete opportunities and business initiatives that arise as things evolve in the changing environment. These are not either-or propositions but should be pursued simultaneously as a form of dynamic adaptive system (Andersen, 2013). This approach emphasizes guidance and sense making from a central analytical process where many individuals can take initiatives to explore and learn from responsive initiatives that inform discussions to sketch new solutions.

Investment in collaborative innovation efforts that incorporate important stakeholder relationships enhance effective adaptation (e.g., Andersen, 2009, Gatti, 2016) that foster co-evolving, collaborative, and thereby durable solutions. Given the complex societal dimensions of major environmental challenges, the collaborative structures should engage stakeholders from across the public, private, and plural sectors involving a diversity of relevant organizations that can jointly invest in the development of sustainable co-evolving economic practices. Each of the partners should be willing to commit sufficient (seed) funding to engage in active collaborative search for viable socio-economic pathways, lead technologies, common market practices, and flexible operating structures to explore for opportunities in an unknown (but exciting) future. This partially constitutes a risk sharing arrangement as the costs of the initial innovation investments are distributed among the institutional participants that in turn can benefit from the extended creative potential of a diverse group of committed contributors with different insights and competencies of importance to the eventual solutions.

The premise is that wicked problems shaped by the complex dynamic environment we are confronting cannot be resolved through pure causation, or *ex ante* planning, there is a need to incorporate (many) open but fully committed exploratory elements. *The only way to find the viable paths forward under extreme uncertainty is through experimentation engaging in incremental learning by doing.*

This is not an easy feat.

Most private and public decision-makers understand the importance of renewed approaches to pave the way for future success and prosperous development and they frequently argue for the need to invest in innovation. However, in practice only few organizations are able to use innovation to create strategic renewal with capabilities to transform existing operating processes, business models, and economic practices. The engagement in innovative growth is often driven by outdated visions without genuine attempts to rethink and renew the way things are done. Investment in innovation often prioritizes new technologies that promise to improve economic efficiency from digitalization of existing operations and cheaper processing of big data. Many investors betting on new technologies do not consider how their engagement can improve existing market offerings and societal contributions in line with an overarching strategic rationale. Established institutions often innovate by investing in new ventures, incubators, accelerators, etc. but rarely identify how it can transform current business operations and economic activities towards more durable practices. Some invest in early-stage partnerships as venture capitalists and often pay dearly for access to new ideas. Others take lower risk investing in late-stage developments but curtail the potential to gain transformative insights from the investment. Public entities may invest in new technologies they believe will solve identified problems although in reality it may constitute well-intended but premature and suboptimal commitments based on incomplete knowledge. Hence, the

reality is that they constitute different bets on eventual winners in simple competitive home-run games where one winner takes it all. This approach lacks the discipline of a long-term strategy with innovation investments as means to gain updated insights that inform the development of new solutions to deal with the complex environmental challenges.

Investments in innovation should systematically explore for viable responses that can address the core issues of the major systemic risks pursuing a clear strategic purpose. The investments should constitute exploratory positions that can generate insights to address important emergent aspects of the underlying systemic issues. Diverse organizations should engage in conscious innovation processes to identify promising opportunities, develop capabilities to make them work, and implement them as the possibilities for change arise. Investing in small probing initiatives (*strategic innovation options*) can identify relevant business and economic opportunities and provide important inputs for the sustainable solutions of the future.

## Platforms (or Space<sup>Forms</sup>) for creative solutions

To enable human social systems with the creative insights required to generate the operational management solutions and adapt the global economic infrastructure in response to the impending environmental exposures calls for advanced forms of knowledge exchange systems that are coherent with the complexity of the systemic risks. We refer to these forms as 'spaces' that can integrate capabilities to support imagination and realisation of new social, organisational, and operating approaches that are more coherent with the emergent risk landscape. The space that most readily lends itself to manage the associated relational system is the so-called multi-sided platform (e.g., Hagiu & Wright, 2015). That is, a model that enables direct interaction between affiliated participant groups. However, the platform concept underrepresents the dynamic, interactive, and complex social experiences that arise when diverse social agents engage and collaborate on generative activities and exchange experiential insights. The term 'platform' is semantically anchored to the flatness of a market place that adds 'sites' or 'sides' to increase the number of possible exchanges. The flat image of a market square is transformed into a technology-enabled platform for various match-making exchanges. While the multi-sided platforms have become an epitome of technology, it is more a model that enables market exchanges. The model has become more efficient by digitizing the associated processes using information technology to extend them with expansive and accelerating properties. The use of information technology has enabled more geographically dispersed individual actors, or clusters of them, to gain access to the 'market' and engage in (regulated) exchanges with many other counterparts. Hence, the platform construct adopts information technology to multiply the number of agents involved in exchanges providing communication and settlement processes to execute them.

This still does not quite capture the intent and wider potential of the platform paradigm. It does not recognise the full extent of a social space that emerges around the multi-layered interactions between diverse intents, interests, actions, and outcomes that constitute important building blocks and inductive elements needed to generate creative solutions to complex issues. These multidimensional aspects of the platform can be consolidated into an organic system with an evolutionary dynamic of idea generation, experimentation, and collaborative development with a capacity to innovate for new solutions. It is this extended paradigm of understanding, designing, and transforming social and organizational systems, we refer to as a Space<sup>Form</sup>.

When the platform is connected to sense making and design capabilities for renewal, it provides a space, a Space<sup>Form</sup>, for transformational capabilities where engaged individuals and groups in the social system can foster a response dynamic that matches the requirements of systemic risks and wicked problems. We find evidence for this in the interdisciplinary conceptual architecture of spatiality developed in the field of Geography. This research has generated a deep understanding of the forms of human presence as it evolves in different locations as the outcome of embedded social experiences. This interdisciplinary research has provided insights into the dynamics of knowledge production and distribution within and across social systems with entangled relationships between diverse human knowledge in the surrounding space (Glückler, 2020).

Spatiality subsumes the experiences, interactions, and exchanges that occur among individual humans in the system due to their presence and proximity to each other. It is a function of things being 'experienced' by diverse interacting individuals with distributed location-relevant information communicated across the system or space. The people convene around the common 'spaces' induced by the shared interests among these engaged individuals, or social groups, and that they can derive value from the engagement while achieving common ends. This social space of coming into being creates a singular entity with its own identity reflecting the intent of those that are active and present within the system. The Space<sup>Form</sup> model depicts exploratory, adaptive, evolutionary spaces with distinctive spatial forms where the principles and objectives of each are inherent to the participants in the system. The spatial epistemology of many, i.e., more than one, or multiples, of these creative, experimenting, interactive, collaborative exchange mechanisms outlines the contours of a unique habitat of innovation systems with a collective ability to generate co-evolving approaches and operating solutions that together has the capacity to adapt and impose sustainable changes on the global economic infrastructure.

The Space<sup>Form</sup> is a distinct entity that engages central thinkers and frontline doers around a common intent to create intelligence that can foster sustainable solutions for future renewal. The involved stakeholders in each of these spaces make an initial investment to establish the Space<sup>Form</sup> and engage in joint sense making discussions that establish a common intent for the future. On this basis, the Space<sup>Form</sup> establishes a series of small probing investments in strategic innovation options that explore various aspects of the evolving environment and uncover prospective opportunities. The Space<sup>Form</sup> facilitates interactive processes of forward-looking reasoning to guide emerging investment initiatives that generate exploratory experiential insights and learning from doing working together with relevant state-of-the-art entities as a portfolio of innovation options. These probes can take different forms and may include venture investments, research centers, individual explorers indeed anything that can contribute and provide useful insights on important dimensions to the underlying issues under investigation. Learning from the active ongoing engagement in small probes and interpreting results through the creative lenses of multiple collaborative partners provides an ideal backdrop that form viable responses to wicked problems in an uncertain evolving context. Hence, the Space<sup>Form</sup> combines a conscious guiding process with analytical thinking based on updated experiential insights to generate adaptive solutions.

The Space<sup>Form</sup> and the system capability nested within it, builds on the strategic thinking of organizational leaders updated by the current insights of many key decision-makers and employees in open discussions that will guide the ensuing search for future solutions while motivating broad engagement in the organizational renewal process (See Figure 1). It offers

a robust set of processes *preparing change* through subsequent *guided exploration* around identified trends and gaps where new relevant knowledge is formed from explorative insights that also identify required capabilities to engage in a prudent escalation of commitments to *execute change* in concrete actions that tackle the emerging challenges. The initial open discussions aimed to generate a common understanding and intent constitutes a *causal learning* exercise commensurate with a planning process informed by updated field experiences and rational analyses of available data and evidence. The ensuing exploratory initiatives generated on the Space<sup>Form</sup> constitutes an *experiential learning* process generated from investment in small autonomous initiatives, probes, or strategic innovation options that generate concrete opportunities for eventual effectuation in the respective organizations. The concrete actions associated with execution of identified opportunities represent *effectual learning* as actions are pursued incrementally to take advantage of accumulated experiences from acting and doing. Preparing for and the eventual execution of change take place within the engaged organizations whereas the guided exploration is carried out on the Space<sup>Form</sup> as a stand-alone entity that takes advantage of the collective intelligence of the engaged organizations and collaborate to generate relevant strategic intelligence.

**Figure 1. The dynamic process of guided exploration on a platform or Space<sup>Form</sup>.**



The Space<sup>Form</sup> represents a system that assembles and engages a diverse set of organizational agents with entrepreneurial acumen and innovative intents, from which a space of renewal activities and eventual solutions can emerge to deal with the wicked problems of complex dynamic environments reflected in systemic risks. It enables a system that delivers renewal capabilities in more effective and efficient ways than any current approaches to exploratory innovation. It provides a space that brings organizations together around a transformational capability that seeds explorative initiatives and structures experiences from them in a thoughtful arrangement around a portfolio of strategic innovation options that can deliver deep intelligence about emerging possibilities, innovative forms, and new business opportunities. The strategic innovation options represent learning hypotheses where ongoing experiential insights capture the dynamic changes in the environment and uncover the capabilities required to modify current operations in ways that enhance a move towards better and more sustainable practices. It also uncovers the capabilities required to advance and exploit the identified opportunities for actual execution and exploitation. It forms an open, interactive, and creative space of transformation that still is rigorous and disciplined by analytical reflections to guide the ensuing sense making activities.

The Space<sup>Form</sup> can produce solutions to emerging challenges through exchange and sharing across diverse types of expertise, knowledge, and experiences that generate innovative ideas and new experiential insights from the probing initiatives manifested as small investments in strategic innovation options. It contravenes a multitude of engaged stakeholders to build and facilitate a strategic innovation and renewal capacity applying modern communication and information technologies to exchange knowledge and ongoing experiential insights to

incrementally develop new viable approaches. It enhances a co-creative collaborative process to design and conduct essential sense-making activities that point towards the future actions and solutions. It is a space where various organizational agents at different stages in their pathway to transformation and renewal have a presence where the interactions among them can model the dynamics of complex adaptive systems.

The creation of a collaborative Space<sup>Form</sup> outside of the individual organizations, as a distinct entity, effectively bridges the two strands of organizational ambidexterity, *structural* and *contextual*. Where proponents of *structural* ambidexterity argue that exploration must be spatially separated from current activities to be free of prevailing norms whereas the proponents of *contextual* ambidexterity argue that change must be linked to insights from current activities to be viable and relevant. The creation of a separate Space<sup>Form</sup> provides a unique spatial environment that is free to explore without restrictions imposed by existing activities in the engaged organizations while still being guided by causal analyses involving relevant leaders, managers and employees from among the investing participants. The insights generated from the exploratory innovation efforts are shared and discussed in fora of involved organizational members. This approach ensures broad inclusion with diverse collective contributions that can foster creative thinking and produce ingenious outcomes. The *co-evolutionary* feature of the knowledge creation process triangulates knowledge and insights from multiple explorative activities on the Space<sup>Form</sup> and thereby enhances the ability to generate valuable solutions for a broad set of constituents in business and society generating viable solutions with wide applications and broad adoption.

The Space<sup>Form</sup> as a concrete manifestation of a spatial ontology is a different and (we believe) better more effective paradigm to capture an interdisciplinary conceptual architecture (see Chôra Blueprint, 2020). It opens for the eventual generation of a multiplicity of Space<sup>Form</sup> entities each of which represents spaces and places that generate innovative renewal capabilities addressing specified organizational and societal issues, systemic risks, or wicked problems. Together the various Space<sup>Forms</sup> may form a whole problem solving system possibly construed with intertwined knowledge links. Each individual Space<sup>Form</sup> constitutes an effective vehicle for collaborative exploratory renewal but an interlinked system of Space<sup>Forms</sup> offers the possibility of expansive knowledge creation that spans across otherwise inaccessible complex dynamic relationships.

## Conclusion

We are faced with complex dynamic environmental conditions where major systemic risks can cause abrupt events with potentially extreme economic impacts but where concrete incidents are notoriously difficult to predict. Even sophisticated attempts to describe the intricate environmental relationships will be incomplete and unable to predict specific events. These conditions make developing economies vulnerable to the adverse impacts of potential disaster events and calls for new ways to arrange and fund the search for sustainable solutions. The fact that local exposures to potential disaster events to a large extent, but not solely are caused by systemic risks linked to the way we operation the global economic infrastructure calls for a fundamentally different approach to generate viable solutions for the future. These efforts must include private business entities as the proponents of the global economic infrastructure together with public, multilateral, and plural sector entities to engage broader social and societal considerations. Adopting formal control-based risk management frameworks are insufficient to deal with the challenge and conventional approaches to invest in innovation are ineffective and suboptimal. We must find new ways to embrace the uncertainty and uncover the opportunities offered by the changing context as it evolves. The only way to gain relevant insights in these complex dynamic contexts is to explore, experiment, and learn from doing. By engaging diverse constituents among private, public, and multilateral institutions to invest jointly in Space<sup>Form</sup> structures, we can explore and search for new sustainable solutions through collaborative efforts that hone the collective intelligence of the engaged organizations. This constitutes a viable and efficient approach that can deal effectively with the current environmental challenges.

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