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Collaboration in Innovation Ecosystems: an institutionally-pulled perspective

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Abstract: This study examines how collaborative innovation processes are activated, structured and coordinated within institutionally-driven innovation ecosystems. Based on a qualitative process analysis of *e.INS – Ecosystem of Innovation for Next Generation Sardinia*, this research traces three sequential phases, namely *activation*, *partner selection* and *coordination*. The findings show that collaboration is governed through regulatory frameworks, rather than relational dynamics. The study contributes to the existing literature in introducing the institutionally-pulled model of ecosystems emergence , showing a multi-level orchestration structure with a public entity as ecosystem architect, and reframing collaboration as directive-driven.
Keywords: innovation ecosystems; ecosystem emergence; institutionally-pulled ecosystems; ecosystem orchestration; public sector innovation; university-led ecosystems; collaboration mechanisms; governance architecture; hub–spoke model; multi-level governance.

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1. Introduction

Over the past two decades, Innovation Ecosystems (IEs) have experienced interest in literature analyzing how heterogenous actors (private firms, startups, public institutions and customers) collaborate to produce system-level outputs outperforming the single-level capacity. Notwithstanding, empirical assessments related to how collaboration is activated, how partners are selected, and how coordination is operationalized in practice remains limited. Existing research largely relies on reviews contributing to conceptual models, offering limited insight on the sequential processes through which collaborative innovation unfolds under real-world conditions.

A further and largely unacknowledged gap concerns the mode of ecosystem emergence (Klimas, 2022). Existing literature assumes two possible trajectories, one spontaneously driven by market or technology forces, the other deliberaty manufactured by a focal firm (Adner, 2017; Klimas, 2022). Within this dichotomy, institutions are typically treated as contextual enablers rather than as primary architects. As a result, limited attention has been devoted to ecosystems in which governance structures precede and shape actors' participation.

At the same time, although orchestration is widely recognized as central to ecosystem functioning, research on IEs orchestration remains underdeveloped (Autio, 2022), and focused on firm-led models, leaving the role of alternative actors, such as universities and public institutions, comparatively underexplored (Gu et al., 2021).

Taken together, these gaps highlight the need for empirical, process-oriented research ton IEs formation and coordination in institutionally-driven settings, where a public institution assumes an architectural role. Responding to these calls, this study investigates the case of e.INS—Ecosystem of Innovation for Next Generation Sardinia, a PNRR-funded national Innovation Ecosystem led by the University of Sassari (*UniSS*). Relying on a fully documented process, the study traces three sequential phases, namely activation, partner selection and coordination, within a policy-driven ecosystem. Accordingly, the study addresses the following research question:

RQ: How are collaborative innovation processes activated, structured, and sustained within an institutionally-pulled innovation ecosystem?

The paper proceeds as follows: Section 2 develops the theoretical framework; Section 3 describes the methodology and case selection; Section 4 presents preliminary findings; Section 5 discusses theoretical implications; Section 6 concludes.

2. Theoretical Framework

2.1 The emergence of innovation ecosystems

The term *innovation ecosystems* (IEs) describes configurations in which heterogeneous (private and public) and interdependent actors collectively generate a coherent, system-level value proposition targeted at a defined user audience (Autio and Thomas, 2022). The concept was then applied to various contexts in accordance with their main characteristics (Klimas, 2022), and received much attention for their enabling role in achieving higher levels of innovation performance (see Klimas, 2022; Ritala & Thomas, 2025). However, research on their actual formation remained limited. Nonetheless, two main streams of theory can be currently recognized and defined by Klimas (2022) "*emergent/implicit*" and "*intentional*". The former emphases a spontaneous process not requiring an architect (Russell and Smorodinskaya, 2018); while the latter sees IEs as deliberately created by a focal firm (Adner, 2017; Dattée et al., 2018; Souza et al., 2024), through "*bottom-up*" or "*top-down*" mechanisms (Autio, 2022). Across these perspectives, the implicit model of formation is market- (Russell and Smorodinskaya, 2018) or technology-driven (Adner 2006; Adner and Kapoor 2010; Gawer, 2014), meaning that a focal opportunity attracts complementary actors (Adner, 2017). On these bases, the majority of researchers connect the ecosystem theory to the resource-based view (Teece 2007, Adner & Kapoor, 2010), or to the *evolutionary theory* (Moore 1993, 1996; Iansiti & Levien, 2004); while only a few studies analyze the emergence of ecosystems under the lens of *intitutional* or *neo-institutional theory* (Auschra et al., 2019; Autio et al., 2018; Bamfo et al., 2023; Vargo et al., 2015). According to the institutional theory theorized by Powel & DiMaggio (1983; 1991), organizations adopt particular structural forms and governance arrangements because an institutional entity, by acting through funding conditions, legal requirements, and formal governance prescriptions, mandates them as conditions of participation (Powel & DiMaggio, 1983; 1991). When the governance architecture precedes the actors, the ecosystem emergence is induced by coercive mechanisms, rather than emergent from actor interaction.

2.2 Orchestration in innovation ecosystems

Whether public or private, and implicit or intentional, some kind of orchestration is necessary to align interdependent actors in the production of a system-level offering

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(Adner, 2017; Autio, 2022). Thus, ecosystem structures often adopt a *Hub–Spoke* configuration, where the hub frequently provides a single interface toward end users and operates as an ecosystem *orchestrator*, while the spokes represent complementary actors contributing services, technologies, and other resources across distributed settings (Valkokari, 2017). Orchestration seeks to both foresee the opportunity of value creation and future capturing possibilities, and engage the actors, taking care of establishing rules for fair and equitable distribution of rights among actors (Adner, 2017; Dattée et al., 2018). To further specify what orchestration operates upon, Autio (2022) conceptualizes ecosystem architecture as comprising three interrelated layers: the *technical architecture*, which defines the functionalities through which participants connect and interact; the *activity architecture*, which specifies the roles and relationships among ecosystem actors; and the *value architecture*, which determines how value is created and appropriated across participants. Building on this idea, Souza et al. (2024), states that orchestration unfolds through a specific process, especially during the early phases of the IE emergence (Souza et al., 2023).

2.3 Collaborative process dynamics in innovation ecosystems

In this context, collaboration can be understood as a structured mode of interaction that involves both sharing knowledge and resources, and decision-making responsibilities (Meireles et al., 2022). The literature suggests that the success of such collaborative processes depends on a set of interconnected organizational and relational enablers that together shape a firm's ability to participate in and benefit from knowledge flows, such as openness, trust, and inter-organizational ties (Naqshbandi et al., 2015; Bogers et al., 2019). However, while the literature has established what conditions facilitate the collaborative processes, it has devoted comparatively little attention to the sequential activities through which collaboration is activated, structured, and coordinated is achieved in practice. This gap is especially relevant in context in which participation is not purely voluntary, rather induced by formal governance mechanisms.

3. Methodology

This study adopts a qualitative research design to examine how collaboration is activated, structured and coordinated within an IE. A single case study approach was selected as purposeful (Eisenhardt, 1989; Miles & Huberman, 1994), theoretically relevant,

accessible, and processually visible (Yin, 2003; Patton, 2002). Therefore, the case of *e.INS — Ecosystem of Innovation for Next Generation Sardinia*, a PNRR-funded national Innovation Ecosystem led by *UniSS* under MUR Investment 1.5 (Mission 4, Component 2), with its traceable and fully documented timeline (2021–2025), was examined. Furthermore, the e.INS*' Hub&Spoke* governance architecture, involving 6 public and 12 private actors, across 10 thematic domains, made the regulatory-mediated orchestration mechanisms directly observable.

The analysis focuses on Spoke 2 (Tourism and Cultural Heritage), led by UniSS, as the micro-unit of analysis, while the broader ecosystem provides institutional context.

Data were collected exclusively from publicly available secondary sources, including the MUR call text, evaluation decree, ecosystem governance documentation, cascade call texts, and institutional reports published on institutional websites.

4. Preliminary findings

The following section presents emerging findings from the documentary analysis of *e.INS — Ecosystem of Innovation for Next Generation Sardinia*. The analysis traces three sequential process phases, namely *activation*, *partner selection*, and *coordination*, identifying a consistent pattern in which collaboration is structured and implemented across formal governance mechanisms rather than relational negotiation. Although the findings are preliminary, they suggest a pattern in which governance orchestration mechanisms that structure who collaborates, on what terms, and through which procedures collaboration unfolds.

4.1 Activation

The *e.INS - Ecosystem of Innovation for Next Generation Sardinia* is a project funded under the National Recovery and Resilience Plan (PNRR). Its activation was formally enabled by the Ministry of University and Research (MUR) through the Notice n. 3277 (30 December 2021), which launched a national call to finance the creation of 12 territorial Innovation Ecosystems across the national territory, each organized with a Hub & Spoke governance structure. The Hub, consisting of state universities, is the implementing entity, thus performs management and coordination activities; while the Spokes carry out research, and can be composed of Universities, Public Research Institutions (EPR), other public or private entities. This call encoded, before any

ecosystem existed, the structural rules of collaboration, namely the requirement for a legally constituted, stable consortium; the mandatory participation of public research institutions as majority Hub members; and the obligation to operate across defined thematic areas aligned with regional specialization strategies.

Moreover, the call specified a multi-phase evaluation procedure consisting in 1) a *manifestation of interest phase*; 2) a *full proposal phase;* and 3) a *negotiation phase* followed by the official decree granting approval and funding. The proposals are assessed by an expert commission appointed by ministry decree on criteria including scientific quality, focus area, feasibility, and expected impact. The case shows *activation* as an institutionally-induced assembly process, in which the ecosystem formation is enabled by regulatory design rather than spontaneous bottom-up emergence.

4.2 Partner selection

Partner selection in e.INS operated at two levels. At the ecosystem level, the MUR call required each ecosystem to involve at least 250 researchers and professionals, with a minimum of 5 and maximum of 10 Spokes, the majority of which had to be public entities. These criteria pre-structured the eligible partner space before any negotiation among actors could occur, functioning as a mechanism that delimits the actor constellation through formal rules, rather than relational processes.

At the Spoke level, a second selection layer operated through the cascade call mechanism. The Spoke 2 through its Spoke Leader (UniSS) issued three cascade calls, inviting SMEs and innovative startups operating in tourism and cultural heritage, to submit innovation project proposals. The proposals had to be filed exclusively via PEC to a dedicated institutional address, within a defined submission window. In addition, the Spoke 2 published three calls for manifestation of interest for i) developing projects supporting territorial development, with a tourism focus addressed to Local Action Groups (GAL), Fisheries Local Action Groups (FLAG), Protected Areas, municipalities, schools, and other interested local public entities; ii) participation in the testing of a new data analysis platform for tourism addressed to SMEs operating in tourism and cultural heritage and local public entities; iii) testing a customer reviews collection and analysis program in the tourism and cultural sector addressed to SMEs. The calls procedural choices encoded governance decisions about which actors could enter the ecosystem's extended collaboration network, under what conditions, and with what obligations.

Across the levels, partner-selection is based on a regulated mechanisms that priorly configures participation, rather than a negotiated process between independent actors.

4.3 Coordination

Coordination across e.INS operates through a vertically layered set of procedural instruments that regulate activities at meta, meso and micro governance levels. At the meta-level, the Hub is required to submit bimonthly documentation of all project activities to MUR, with particular reference to milestones and targets, and bimonthly reporting of implementation indicators. This monitoring mechanism is meant to keep the operational orchestrator accountable to the meta-orchestrator through formalized reporting cycles. At the Hub–Spoke level, coordination is mediated through formal governance instruments, whereby the Hub defines administrative procedures, reporting requirements, and operational guidelines that Spokes and affiliated partners are required to follow. This configuration can be interpreted as a downward coordination mechanism, through which ecosystem-wide rules and standards are translated into Spoke-level implementation. At the Spoke–participants level, coordination is structured through the procedural architecture of the cascade call, which defines eligibility checks, evaluation criteria, scoring mechanisms, and contractual obligations.

Throughout all levels, coordination is mediated through procedural and documentary instruments (e.g., calls, reporting systems, evaluation procedures and contracts), rather than relational or informal mechanisms

5. Discussion

The findings from e.INS empirically sustain the concept of institutionally-pulled ecosystem emergence introduced in the theoretical framework. In line with the coercive isomorphism mechanism described by DiMaggio and Powell (1983; 1991), the ecosystem formation is predominantly procedural and document-mediated rather than as a result of strategic or relational negotiation or market dynamics. This extends the prior conceptualizations of the firm-led models described by Adner (2017) and Dattée et al. (2018), where a focal firm strategically defines roles and rules to enable value capture. In contrast to these, e.INS shows that the ecosystem architecture can be manufactured by a public institution acting through regulatory authority, suggesting that institutionally-pulled IEs constitute a distinct governance configuration.

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Furthermore, the orchestration architecture of the e.INS case revealed a multi-level governance structure, constituted by a meta-orchestrator (MUR), a meso-orchestrator (Hub), and a micro-orchestrator (Spoke leaders). This architecture extends existing theory on orchestration models (Autio, 2022; Jacobides et al., 2018), by empirically demonstrating that orchestration is not necessarily performed by a single actor, rather be distributed across layered governance levels. The architecture layers identified by Autio (2022), comprising *technical*, *activity*, and *value*, can be identified across the three phases of the e.INS process. The *technical* architecture is primarily established at the meta-level by MUR through the design of the call and its procedural infrastructure, which defines how actors' access and interact with the system. The *activity* architecture is articulated across levels, with the calls specifying roles, eligibility conditions and collaboration requirements. Finally, the *value* layer emerges through the configuration of expected outputs, which define both contributions and benefits. Rather than being centralized within a single orchestrating actor, these architectural elements are distributed across multiple levels of governance, reflecting a layered and procedural form of ecosystem coordination.

Across all phases, the consistent finding is that collaboration in e.INS is enacted through governance directives rather than through the organizational and relational enablers, that the literature emphasizes (Naqshbandi et al., 2015; Bogers et al., 2019). This finding suggests that in institutionally-pulled ecosystems, the governance directives act as primary coordination mechanism, that structures the collaboration system in advance.

6. Conclusion

This study investigates how collaborative practices and orchestration activities unfold within an institutionally-driven Innovation Ecosystem, through the case of *e.INS — Ecosystem of Innovation for Next Generation Sardinia*.

Utilizing a documental analysis to track back the collaboration mechanisms of activation, partner selection and coordination, the study shows a case in which collaboration is pulled by governance frameworks rather than relational or strategic negotiation activities.

The findings, although preliminary, suggest three main contributions: first, the identification of a different model of IE emergence, the *institutionally-pulled*, where a public entity configures as the architect, extending previous firm-centric models of intentional IEs formation; second, the presence of a multi-level orchestration architecture where coordination is distributed across different layers, widening the dominant single-

orchestrator vision; third, the insight that in institutionally-pulled IEs collaboration among actors is mostly triggered by encoded directives, rather than by relational enablers. The limitations of the study lie in the use of secondary sources only, whereas interviews with the involved actors could provide interesting insights from the relational standpoint; and in the choice of a single case design, which challenges generalizability of the findings.

Future research could extend this work by selecting other institutionally-driven IEs, and by implementing other qualitative methods (e.g., interviews) to explore how formal governance interacts with the relational processes. Moreover, future research might examine whether this mode of instituted collaboration produces different innovation outputs compared to IEs in which collaboration is largely voluntary.

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