

DELIVERABLE 4.3

REPORT ON THE BEST PRACTICES FOR ECOSYSTEM ORCHESTRATION

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EINST4INE



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ABOUT EINST4INE

The European Training Network for InduStry Digital Transformation across Innovation Ecosystems, also known as **EINST4INE**, is a consortium of universities, research organisations, and industry partners working in the domain of industrial digital transformation.

EINST4INE aims to develop new concepts, approaches, and methods in the area of digital transformation and brings together a unique group of world-leading experts in the areas of Open Innovation, Industry 4.0, digital transformation, and innovation ecosystems. '**Deliverable 4.3**' (D4.3) is one of the technical reports produced from the ongoing research conducted within this network. It aims to disseminate cutting-edge knowledge from research and practice in addressing future industrial challenges – for D4.3, we focus on best practices for ecosystem orchestration.

Read more at: <https://www.einst4ine.eu/>

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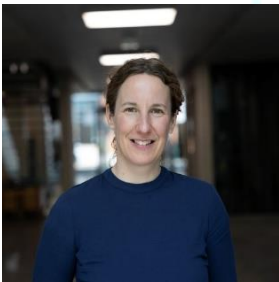
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INTRODUCTION

The challenges our societies face today call for multi-layered and consistent collaboration across heterogeneous actors from a variety of sectors and disciplines (Paavola & Lahtinen, 2023). Ecosystems – i.e., interdependent sets of organizations that together enable reaching a system-level goal or a value proposition (see e.g., Adner, 2017; Thomas & Ritala, 2022) – present an especially helpful form of organization (Kretschmer et al., 2022) that holds a lot of potential for confronting the rather demanding challenges of our times (Ritala et al., 2023). While initially coined in 1993 by Moore (see Moore, 1993), the ecosystem lens was increasingly adopted especially from the 2010s onwards, initially in the form of “innovation ecosystems” (Adner, 2006; Rohrbeck et al., 2009; Adner & Kapoor, 2010; Ritala et al., 2013), and later in a variety of different conceptualizations. Now, the ecosystem has become a mainstream concept, and it has been adopted by management scholars and practitioners.

During the early 90s, management scholars started to pay attention to the ways organizations were coming together to learn and complement each other in different aspects such as R&D, innovation, production, and marketing (see e.g., Mowery et al., 1996). This is when strategic alliances and bilateral partnerships became the focus of their inquiries. Gradually through the 90s and 00s, researchers started to discuss more and more about different types of multilateral communities and networks, including value networks (Allee, 2000), strategic networks (Gulati et al., 2000), meta-organizations (Ahrne & Brunsson, 2005), and innovation networks (Dhanaraj & Parkhe, 2006). The movement towards analyzing business and innovation via network lenses reflected the increasing connectivity and collaboration opportunities between organizations. What then made the ecosystem an attractive alternative conceptual lens was that it allowed researchers and practitioners alike to imagine a collaborative form of organization characterized by organizational fluidity (e.g. Gulati, Puranam and Tushman, 2012; Moore, 2013; Järvi et al. 2018), able to self-organize flexibly, in ad-hoc (not patterned) ways in response to the uncertainties of its environment (Schreyögg & Sydow, 2010). While acknowledging their fluidity, and ability to self-organize, it is important to highlight that they also incorporate purposive action, design choices (Valkokari, 2015; Daymond et al. 2022), and specific organizing elements (Järvi et al, 2018) that enable their coordination.

Orchestration refers to the type of coordination that is particularly attuned to loosely coupled contexts, such as innovation and knowledge networks (Dhanaraj & Parkhe, 2006; Ritala et al., 2023), and ecosystems (see e.g., Autio, 2022). The common denominator behind different studies and definitions of orchestration is the style of coordination which differs from hierarchical, contracts-based management and focuses more on setting the roles, conditions,



and structures that enable actors to create value together (Autio, 2022). Another distinctive factor is the loosely coupled context - i.e. the situation where ecosystem or network participants are both independent and interdependent at the same time (Orton & Weick, 1993) - creating the need to find ways to achieve a common agenda for activities that cannot be fully hierarchically controlled.

Ecosystems take shape and evolve over longer periods. They tend to evolve in flexible, yet unpredictable environments rather than through predictable plans and implementing fixed steps. However, ecosystems are also designed and planned, and leading this evolutionary process requires a lot of adaptation and flexibility, and a strategy that is aligned with frequent changes. Many ecosystems that are built are not eventually successful (Jacobides et al., 2023); those that are, often involve leadership that consists of a flexible, adaptive approach to developing collaboration with a diverse set of partners and offering joint value to customers and stakeholders. Orchestration is a highly heterogeneous activity and can involve facilitation-type orchestration, brokering of relationships, creating enabling conditions, or neutral third-party mediation, for example (see e.g., Hurmelinna-Laukkanen & Nätti, 2018; Pinnington et al., 2021; Ritala et al., 2023).

Along with the proliferation of the ecosystem lens, scholars have started to distinguish a variety of ecosystem conceptualizations that serve different purposes and describe different empirical contexts. While the coordinating nature and objective to create value by orchestrating the activities remains the same, the specifics of the orchestration practices can vary based on which type of ecosystem is being orchestrated. In this report, we discuss four common ecosystem types (**knowledge ecosystems, entrepreneurial ecosystems, innovation ecosystems, and platform ecosystems**) from the perspective of best practices in ecosystem orchestration. We derive evidence on these best practices from an extensive, systematic literature review on ecosystem orchestration, as well as from our first-hand evidence from companies affiliated with EINST4INE network and related research.

In the following sections, we go through the best practices of ecosystem orchestration as it comes to these four common ecosystem types. In each section, we first define each ecosystem type, and then we explore three distinct questions related to their orchestration: **Who is orchestrating, what are the desired outcomes, and what are the most notable orchestration practices?** We then conclude with reflections on ecosystem leadership as a practice (and how that potentially differs from ecosystem orchestration), as well as summarize the best practices of orchestration as discussed in this deliverable. Practitioners interested in ecosystem orchestration can gain insight into the scientific developments in this field while learning from illustrative cases to prompt reflection on their management practices.



ORCHESTRATING KNOWLEDGE ECOSYSTEMS

Knowledge ecosystems consist of users and producers of knowledge that are organized around a joint knowledge search (Järvi et al., 2018). Oftentimes knowledge ecosystems involve both for-profit and public sector actors such as research institutions, and they are focused on particular domains of interest such as high-tech (Van der Borgh et al., 2012) or around a certain regional or national knowledge development agenda (Öberg et al., 2022), for example.

Who is orchestrating?

Knowledge ecosystems range from shorter-term to longer-term phenomena, and therefore the type of entity orchestrating them also differs. The shorter-term knowledge ecosystems are often organized as projects that aim to identify, iterate, and create knowledge in some domain, and therefore they tend to have a project manager or coordinator (see e.g. Järvi et al., 2018). Such an orchestrator is often an individual who is representing an entity such as a university, or a for-profit actor such as a major organization that is driving a particular ecosystem. The longer-duration knowledge ecosystems are often operated by several hub actors and might include universities or research institutes as the entities responsible for organizing the practices that support joint knowledge search activities (see e.g. Rådberg & Löfsten, 2022; Öberg & Lundberg, 2022).

What are the desired outcomes?

Knowledge ecosystems are organized around joint knowledge search, and therefore the outcomes ideally include identifying knowledge domains that are valuable to the participants of that ecosystem and more broadly, new knowledge that is created in those domains (Järvi et al., 2018). Outcomes of knowledge ecosystems could also be improved insights on how knowledge development is best organized, in addition to the knowledge development in itself (Öberg & Lundberg, 2022).

What are the most notable orchestration practices?

Orchestrating something as intangible as knowledge production requires a facilitative and enabling approach. In knowledge ecosystems, fully-fledged organizational practices are absent (Järvi et al., 2018), and thus a lack of hierarchical control. However, knowledge creation requires *resourcing*, including financial resources, project management, and for example, research infrastructure such as laboratories and equipment (Rådberg & Löfsten, 2022). The orchestration practices also include setting up events, meetings, and arenas of exchange for knowledge



ecosystem participants (Järvi et al., 2018). Essentially, practices and mechanisms aim at knowledge transfer and engagement between participants to facilitate this (Angrisani et al., 2023). Therefore, much of the orchestration required relates to the setting up of *enabling conditions* including resourcing and matching up ecosystem participants in a multitude of ways.

ARENA2036

CASE STUDY: ORCHESTRATING A KNOWLEDGE ECOSYSTEM THROUGH SPACE AND PEOPLE

As part of the EINST4INE network, we have been studying an interesting interplay between space and people where ecosystem orchestration happens at ARENA2036. ARENA2036 is a management association that dubs itself as ‘the innovation platform for production and mobility’ whereby members can meet, collaborate, and innovate on research and industry projects in a space coordinated by ARENA2036. The research coordination team provides support to their members from access to funding, access to a large network, facilitating knowledge transfer, and much more.



Figure 1: ARENA2036 Shopfloor (Source: ARENA2036.de)

The ecosystem is made up of big players in the sector, SMEs, startups, and research institutions to bring everyone ‘beneath one roof and on equal footing’. These were guidelines set out by the German Federal Ministry of Education and Research, of which the research campus initiative was commissioned, and brought to life by the ARENA2036 (the first of nine research camps). One of the most important and unique aspects of the space is the ‘research



campus culture' that has been fostered here and enables the ecosystem and its knowledge and innovation work to flourish.

This initiative was initially commissioned by the German Federal Ministry of Education and Research as a recognition of a need to innovate the production and mobility industries, in ways that are not possible by one company or institution and strengthen the leading position of Baden-Württemberg and Germany in the automotive industry. What they needed was the infrastructure to collaborate effectively with all necessary players to co-create the future of mobility and production, essentially a home for the existing ecosystem to better collaborate.

How does the ARENA2036 coordination team orchestrate? Here are a few notable ways we discovered:

1. **Patience is key** - particularly when wanting to enable radical innovation, orchestrating diverse members is not a simple process. A lot of back and forth is required, answering questions and problems, motivating partners to commit, sustaining momentum, and other challenges occur. In this case, the patience of those orchestrating these interactions and processes is key.
2. **Openness by example** - at ARENA2036, the notion of 'equal footing' is important to allow everyone to collaborate without any barriers. This is evident through both the management, members, and space. Having a large open and unrestricted shopfloor, you can freely move around the space and approach anyone to start a conversation as individuals rather than representatives of an institution or role. The relaxed and casual atmosphere reduces any traditional hurdles that, for example, a startup may face in approaching a large player.
3. **'Show and tell'** - hosting a collaborative space where members can come together and work on demonstrators for their new technologies and developments, provides a great opportunity for people to work tangibly on something together irrespective of their 'home institutions' and be able to communicate much better what they are doing.
4. **Identification, rather than alignment** - while aligning members on aspects of the innovation is important so that everyone is on board with projects and ideas, the coordinators at ARENA2036 appreciate that they are dealing with a diverse range of players who can't necessarily align, nor need to. The goal is not to get everyone to see in the same way but to acknowledge and respect the diverse perspectives and instead focus on each partner being able to identify with ideas and projects from their perspective.



- 5. Continuous conversation** - whether it is within the coordination team or among members, maintaining both formal and informal communication with everyone becomes very valuable in the overview of the ecosystem and how it is functioning.

Ecosystem orchestration can be quite fuzzy as a practice, particularly when there are a host of social, relational, contractual, and spatial effects at play. Depending on the type of ecosystem and your goals, it is important to consider the influence you can have in less obvious ways and accept that the orchestration is being driven not only by yourself but as a part of the interaction between members and other participants in the ecosystem.



ORCHESTRATING ENTREPRENEURIAL ECOSYSTEMS

Entrepreneurial ecosystems are geographically defined places or contexts, such as Silicon Valley, where different entrepreneurial ideas, opportunities, and eventually business models are created, and benefit from the interactions and resources that are available within that ecosystem (Wurth et al., 2022). The objective is to create new ventures (entirely new firms or new business areas for existing firms), that in turn fuel the economic development of the region (Hakala et al. 2020).

Who is orchestrating?

Entrepreneurial ecosystems are dynamic communities of entrepreneurs, investors, support services, and institutions that work together to foster innovation and business growth (Wurth et al., 2022). The orchestrators in these ecosystems can vary widely and the roles of orchestrators are in constant change (Tabas et al., 2023). Therefore, orchestration in these settings is much more decentralized and distributed than in other ecosystem settings, including not only individual but “shared orchestration” (Santos et al., 2023). Potential orchestrating entities include a variety of support organizations such as government agencies, venture capitalists, startup accelerators, and educational institutions (see e.g., van Rijnsoever, 2022). These entities provide essential resources, mentorship, and networks necessary for startups to thrive. Influential individuals and entrepreneurial opinion leaders (Tabas et al., 2023), also play an important role in shaping and guiding these ecosystems. Entrepreneurial ecosystems can be seen to also exist irrespective of the governance structures, i.e. no one is necessarily doing any intentional comprehensive orchestrating (Hakala et al., 2020).

What are the desired outcomes?

The primary goal of an entrepreneurial ecosystem is to nurture a vibrant environment where startups and entrepreneurial individuals can (co)operate. Desired outcomes include entrepreneurial opportunity discovery and pursuit, which is realized in practice as new business models (Autio et al., 2018), and by extension, increased startup formation, job creation, and economic growth (Content et al., 2020). Furthermore, these ecosystems aim to foster a culture of innovation and collaboration by favoring and building social and business networks in this resource-providing system (Hernández-Chea et al., 2021), leading to the development of new technologies, products, and services that can have a significant societal impact. This is achieved by voluntary horizontal knowledge spillovers between actors in the entrepreneurial ecosystems (Autio et al., 2018).



What are the most notable orchestration practices?

Effective orchestration in entrepreneurial ecosystems involves creating favorable policies and infrastructures that support business creation and growth. This includes providing access to funding, mentorship programs, networking opportunities, and incubation spaces, for instance (e.g., van Rijnsoever, 2022; Hernández-Chea et al., 2021). Orchestrators also play a critical role in building a community culture that encourages risk-taking, collaboration, and knowledge-sharing. Additionally, they facilitate connections between different ecosystem players, such as linking startups with investors and experienced mentors (Tabas et al., 2023). Actors that are well-positioned and have the appropriate resources, such as universities, can act as orchestrators to stimulate entrepreneurial activities by providing training programs, and financial resources, facilitating connections, and developing an entrepreneurial culture (Schaeffer & Matt, 2016).

CASE STUDY: VARIOUS ROUTES TO ORCHESTRATING ENTREPRENEURIAL ECOSYSTEMS – SILICON VALLEY VS HELSINKI REGION

The best entrepreneurial ecosystems are characterized by good access to knowledge, finance, and talent. They have well-functioning intermediaries, developed infrastructure, and good access to customer markets. They are institutionally stable, with a culture for entrepreneurship and good networks also to other ecosystems.

Let's consider the entrepreneurial ecosystem of Silicon Valley, often cited as one of the best in the world. Silicon Valley's governance can be described as self-organizing orchestration. This means that while there are formal institutions like governments and universities that play important roles, much of the ecosystem's success comes from informal networks and relationships. Entrepreneurs, investors, and other actors in the ecosystem interact dynamically, creating a feedback loop that continually shapes and reshapes the ecosystem. For example, successful entrepreneurs often become angel investors or venture capitalists, providing funding and mentorship to the next generation of startups. Similarly, companies in the region often collaborate with local universities on research and development projects. This self-organizing orchestration allows the ecosystem to adapt quickly to changes in technology and market conditions. It also fosters a sense of community and shared identity among the actors in the ecosystem.





Figure 2: Silicon Valley

(Source: <https://www.economist.com/business/2021/07/01/the-future-of-silicon-valley-headquarters>)

On the other hand, the Helsinki region in Finland, also recognized as the Nordic hub for start-ups and a highly developed entrepreneurial ecosystem shares a lot of the same features with Silicon Valley. However, Helsinki has been recognized for its local connectedness (for example by the Startup Genome reports <https://startupgenome.com/all-reports>). This sense of community correlates highly with indicators of overall ecosystem performance such as startup output, startup valuations, exits, unicorns, and ecosystem value. While both Helsinki and Silicon Valley ecosystems are self-organizing, Silicon Valley's governance is more characterized by its dynamic and competitive nature, whereas Helsinki's governance is characterized by its local connectedness and community-oriented approach, illustrating the different possible routes towards effective ecosystem orchestration.



Figure 3: Helsinki region

(Source: <https://www.hel.fi/en/news/helsinki-espoo-and-vantaa-to-continue-the-joint-promotion-of-competitiveness-and-innovation>)



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ORCHESTRATING INNOVATION ECOSYSTEMS

Innovation ecosystems are considered alignment structures where different complementary actors and inputs are needed to provide a shared solution (Adner, 2006; 2017). The “innovation” in innovation ecosystems can relate to the innovative outcomes produced by integrating different complementarities, the process in which ecosystems create new innovative solutions, or the contexts in which such ecosystems operate (for discussion, see Ritala & Thomas, 2025).

Who is orchestrating?

Innovation ecosystems are composed of organizations, individuals, and other stakeholders collaborating to produce novel products, services, or technologies. These ecosystems are typically orchestrated by key industry players also known as hub actors, ecosystem leaders, or keynote actors (Iansiti & Levien, 2004; Rohrbeck et al., 2009; Ritala et al., 2013). These orchestrators work to align the goals and efforts of various ecosystem participants, including businesses, researchers, and end-users, to drive innovation and value proposition delivery (Adner, 2006; 2017).

What are the desired outcomes?

The ultimate aim of innovation ecosystems is to foster an “alignment structure” wherein the inputs from complementary organizations are integrated to provide valuable solutions for customers that create and capture value for all participating actors (Ritala et al., 2013; Adner, 2017). Desired outcomes from such alignment structures include technological advancements, marketable innovations, and solutions to complex challenges, for instance.

What are the most notable orchestration practices?

Orchestrating innovation ecosystems involves creating mechanisms for mutual and individual value creation and value capture (Ritala et al., 2013). Orchestrators often possess control or access to a key technology or a solution, and then coordinate the roles of other actors to complement those to ultimately deliver a value proposition to customers. Ecosystem orchestrators thus play a pivotal role in setting a strategic direction and vision that enables integrating the inputs and complementarities to create value (Autio, 2022). In addition, the orchestrators themselves must establish a strong position and contribution to the ecosystem, efficiently manage partners and resource flow between them, and be able to effectively convince partners to commit and engage (Lingens & Huber, 2023). Essentially, the orchestrators need to handle challenges and realize opportunities related to multiple logics in the innovation



ecosystem, thus sustaining the right balance among competing interests and agendas (Poblete et al., 2022).



CASE STUDY: EFFORTS AND CHALLENGES OF ORCHESTRATING AN INNOVATION ECOSYSTEM IN AN INDUSTRIAL CONTEXT

Innovation ecosystems, while highly effective in most contexts, are not always the optimal choice for every industry or company. This can be particularly evident in more traditional sectors like energy and the petrochemical sector, where the dynamics might differ notably from other industries.

As a partner in the EINST4INE consortium, the MAIRE Group, is a prominent Italian-born global leader in engineering and construction, which specializes in industrial plant projects, particularly in the hydrocarbon and petrochemical sectors. Recently, Maire has branched out into green chemistry through their subsidiary, NEXTCHEM (Chesbrough & Nicolais, 2021). With NEXTCHEM, the company aims to shift from fossil-based resources to more sustainable methods, aiming to minimize the environmental footprint of conventional processes, promote circular economy projects, and incorporate biological components such as waste in chemical processing.

To advance its initiative, the objective of the MAIRE subsidiary is to develop an innovation ecosystem that scales proprietary technologies, involving various actors like research institutions, industrial partners, strategic consumers, and communities. This ecosystem aims to foster collaboration and innovation in sustainable fuels, fertilizers, and other industrial applications.

However, several inherent challenges in this sector make the orchestration of such ecosystems complex.

1. The monopolistic role of incumbents: In this somewhat traditional industry, many incumbent companies hold a monopolistic role, which can provide them with a market advantage. This dominance can sometimes hinder their openness and willingness to collaborate in loosely coupled relationships, reinforcing contractual relationships over relational and digital coordination mechanisms (see EINST4INE WP4 D4.2 deliverable on validated framework for key relational, contractual, and digital coordination mechanisms for ecosystem building and management).

2. Slow technology development cycles: Previously, digital technologies shared a similar life cycle with modern physical (or "hard") technologies, characterized by high investment costs, significant capital expenditure (CapEx), and the need for specialized skills. As digital



technologies, like software, have rapidly evolved, they have become less resource-intensive compared to certain hard technologies. The same goes for long-hard technologies, like solar panels, which initially required long-term investments. Over time, the development and implementation of solar technology have become easier and shorter. In contrast, newer green technologies, such as gasification techniques or advanced catalysts, still typically undergo a development, testing, and market readiness phase lasting 10 to 15 years. Given the time-consuming nature, complexity, and scale of such physical innovations, there is a significant need for meticulous management in engaging and aligning the various stakeholders involved. This process rests on the establishment of trust and clear goals between the parties involved.

3. Need for physical testing facilities: While digital technologies assist in initial modeling and visualization, later stages of development often require physical pilot plants. This necessity for physical infrastructure for testing can limit the involvement of external contributors, who might not have access to such resources or are too far away.



Figure 4: MyReplast (a subsidiary of NEXTCHEM) industrial plant (Source: Media Resources at NEXTCHEM (<https://www.nextchem.it/en/newsroom/media-resources/>))

The orchestration of innovation ecosystems like this necessitates the careful alignment of the diverse interests of all stakeholders involved in these innovation initiatives, which can be difficult to achieve in new and uncertain environments. For example, **local communities** are significantly affected by the construction and operation of physical testing facilities. These projects, often perceived as hazardous, can be intimidating and potentially unwelcome due to their size and impact.



Moreover, the shift towards green chemistry frequently involves using alternative raw materials like agricultural waste or biological materials. This change can significantly transform the supply chain and logistics, necessitating the establishment of **new supplier relationships and logistical arrangements**. Additionally, transitioning to a new business model and technology entails **cultural and organizational shifts**. Employees must be trained in new methodologies, and the organizational structure may require adaptation to support emerging business models.

Finally, high stakes and high investments, particularly in sectors with slow technology development cycles and a need for physical testing facilities, often limit the entry of complementors into the ecosystem. Typically, a top-down approach is employed where the focal company selectively chooses its partners, engaging in an iterative process to build the ecosystem's value proposition.

Thus, while innovation ecosystems offer numerous benefits, their effectiveness is context-dependent. For NEXTCHEM's projects, alternative models like research networks, innovation hubs, or strategic alliances might be also suitable. These models offer more control and focused collaboration, aligning with the industry's specific needs and challenges.



ORCHESTRATING PLATFORM ECOSYSTEMS

Platform ecosystems are ecosystems that operate on a digital platform and by doing so, enable efficient matching of transactions of ecosystem participants, or generativity of complements provided (i.e. creating and using additional features) in the platform, such as software applications or content (Cennamo, 2021). A well-known example of platform ecosystems is app stores such as Google Play or transaction platforms such as Amazon Market Place.

Who is orchestrating?

Platform ecosystems revolve around digital platforms that connect various users, services, and resources in a network. The orchestrators are typically the platform owners and platform leaders, which can range from tech giants to emerging startups. These entities manage and govern the platform, ensuring that it meets the needs of its diverse user base, which can include app developers, service providers, and end-users. Typically, the platform orchestrator establishes APIs (Application Programming Interfaces) and a variety of standardized rules and protocols to enable ecosystem participants to join the platform and interact with it (Karhu & Ritala, 2021).

What are the desired outcomes?

The goal of a platform ecosystem is to create a thriving, self-sustaining network that delivers value to all its participants. In other words, platform ecosystems seek to achieve *generativity* - the unprompted innovation potential available from platform ecosystem complementors such as app developers or content providers (Thomas & Tee, 2022). Desired outcomes of platform ecosystem orchestration thus include a growing user base, an increasing number of services or applications developed on the platform, and continuous platform engagement by the users and complementors (Rietveld & Schilling, 2021). Recently, scholars have also identified that generativity in platform ecosystems can be directed toward resolving social and ecological challenges (Ritala, 2023).

What are the most notable orchestration practices?

Effective orchestration in platform ecosystems involves balancing the needs and interests of all stakeholders and resolving core tensions between control and openness of the platform (Cennamo & Santalo, 2019). To accomplish these goals, the orchestrator needs to make careful platform design choices, including developing fair and transparent policies, ensuring platform security and privacy, and providing tools and resources to support developers and service providers, for instance (see e.g. Tura et al., 2019). In addition to providing all the necessary infrastructure and rules for ecosystem actors to operate on the platform, the platform



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orchestrators can also provide their additional services on the platform, such as is the case in the Google native apps on Android (Gmail, Google Maps, etc.).



CASE STUDY: ENEL X, AN INDUSTRIAL DIGITAL PLATFORM ECOSYSTEM AROUND SUSTAINABLE ENERGY SOLUTIONS

Enel X is a global business line of the Enel Group, specializing in energy supply and energy management services. It aims to provide an integrated ecosystem of solutions based on a platform business model. These solutions include assets for optimizing and self-producing energy and management solutions. Enel X's services are designed for a wide range of customers, including residential (Business-to-Consumer or B2C), business (Business-to-Business or B2B), and public administrations (Business-to-Government or B2G), supporting their journey in the energy transition.

Enel X offers a range of platforms and solutions targeting different customer segments. Each of these platforms is tailored to meet the specific needs of its target audience, leveraging innovative and digital technologies. For instance, the platform for public administrations (B2G) is designed to assist in managing city infrastructure and services more efficiently and sustainably. It includes solutions like smart public lighting, electric public transportation, energy efficiency for public buildings, architectural lighting, digital services, and smart urban design.

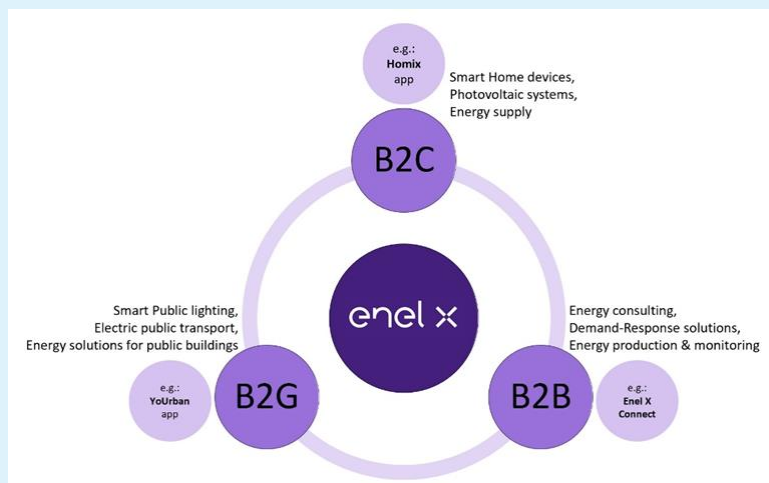


Figure 5: ENEL X ecosystem offerings Source: Enel X official website – “Our Offer” (<https://corporate.enelx.com/en/our-offer>)

Enel X's platform offerings are designed to seamlessly interconnect, delivering tailored services to various customer segments through multiple devices like industrial equipment, home appliances, and transportation modes.



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Unlike typical commercial platforms (e.g. Apple, Netflix, etc.) Enel X operates more as an industrial platform, where ecosystem orchestration might follow different dynamics, focusing more on integrated solutions across diverse sectors (Jovanovic et al., 2021; Ritala & Jovanovic, 2023).

1. Distributed control in industrial settings and selected ecosystem partners: Enel X leverages advanced digital solutions like smart meters and sensors for tailored services in different sectors. By working closely with government officials and understanding specific city needs, they adapt their technologies for public lighting and other uses. Similarly, B2B and B2C solutions, like smart appliances, require iterative adaptation to different machinery types.

2. Closed Structure due to critical services: Enel X generally maintains a closed structure for its platform due to the critical nature of its services, focusing on ensuring reliability and security in energy management and urban infrastructure solutions.

3. Openness through data sharing and collaborations: Simultaneously, Enel X adopts some openness by using public datasets and APIs. This approach enhances urban development planning and fosters innovation. Their open data portal aids municipalities, while APIs like the Enel X Way Charging Points data flow support regional planning and electric mobility. This openness encourages strategic partnerships and new service development (Enel, 2023).

4. Re-programmability of the platform: Enel X's platform is facilitated by its modular structure. The modular nature of the platform ensures that modifications can be made efficiently, while AI and data analytics enhance the performance of physical technical products (Enel X, 2023).

Enel X, while providing infrastructure and setting rules for its platform's ecosystem, faces several orchestration challenges. These include managing diverse data types with varying security and privacy requirements across different customer segments, such as public data for B2G and private data for B2C. Additionally, the company needs to integrate various technologies and systems to meet distinct needs, continuously adapt to rapidly changing market demands and technological advancements, and ensure alignment with sustainability and efficiency goals.



ECOSYSTEM LEADERSHIP AS A PRACTICE

While both ecosystem orchestration and ecosystem leadership involve managing and influencing ecosystems, orchestration is more about coordinating interactions and ensuring collaboration while leadership focuses on setting the vision and influencing the overall direction of the ecosystem. Setting up, promoting, cultivating, and sustaining a successful ecosystem requires leaders to influence participants or potential new joiners of an ecosystem. Ecosystem leadership can be seen as solving coordination problems and enabling cooperation on the ecosystem level. Leadership in ecosystems involves assisting with problem-solving in areas where market forces do not solve them (Foss et al., 2023). In many cases, an entity within an ecosystem may take on both roles, orchestrating the collaboration among participants while also providing leadership to drive the ecosystem's success.

Getting the strategy right for ecosystem leadership is a major challenge. Leadership of ecosystems requires a different mindset and different, new management styles to firms' traditional management. This can be particularly challenging for legacy firms, as this calls for change management and creates new leadership challenges.

Leadership skills and attitudes that succeed in ecosystem strategy include visionary leadership, and commitment, shaping and adapting strategy. These attitudes are found in firms that value open experimentation with the structures, principles, systems, and values of ecosystems. Such ecosystems are often led by digital natives.



Ecosystem leadership - key differences to traditional leadership

Successful ecosystem leaders tend to be more curious than determined, more humble than assertive, better at listening than presenting, and they exhibit strong empathy and are willing to admit mistakes and make compromises.

(Jacobides et al., 2023:19)



Successful ecosystem leaders need distinct leadership traits regarding their thinking models, mindset, behavior, and strategic style compared to traditional leadership.

New ecosystems leadership requires:

1. Imagination

New thinking models such as imaginative thinking and systems thinking are needed to envision new solutions or to uncover unmet customer needs.



As success in ecosystems depends on the whole system's performance, not on individual contribution, a systems-thinking mindset is needed. Value is created and delivered by a multitude of organizations within the ecosystem. Opportunities for ecosystems can be identified by developing new solutions for customer needs. While traditional leadership's focus is on optimizing operational activities and capabilities, the ecosystem can address complex challenges and enable solutions an individual firm could not offer. Actors in an ecosystem offer a joint value proposition through creative collaboration and imagination.

2. Strategic style adaptation

Ecosystem strategy must adapt to frequent changes as it reshapes the strategic environment. A strong focus needs to be on value creation not only on capturing value, shaping strategy, adaptive strategy, visionary leadership, and commitment, combined with long-range communication skills.

Value creation in an ecosystem happens by focusing on growing the pie together, rather than one's share. Focusing on growing the shared value - rather than on value capture - and creating value for customers yields the best overall value, so everyone can benefit from it.

Key leadership skills include multitasking, quick assessment of new and changing situations, willingness to experiment, openness to failure, and trying new, different approaches.

3. Mindset adaptations

In an ecosystem, collaboration is key to success. While firms may still be competitors, they need to be open to compromise, engage in reciprocal activities, and have a high degree of tolerance for uncertainty and ambiguity.

Innovation and value are created not by an individual organization. It is created together with other organizations from both within and outside the ecosystem. This requires leaders to look beyond what their organization may be able to offer and to look for ideas and input from outside their industry or area of expertise. Thus, an ecosystem mindset needs to foster collaboration, patience, stamina, an outward focus, and being at ease with ambiguity and uncertainty.

4. Behavior changes

Changes that are needed for ecosystem leadership include humble leadership, leading from behind, and trust-based leadership. Independent actors in an ecosystem need to voluntarily collaborate. Leadership in ecosystems is thus not in full control and creates a joint value vision, authenticity, and credibility. Still, this includes taking responsibility for the behavior of



partners. Less formal ways of leadership such as influencing, moderating, and networking yield better results.

Effective leadership in ecosystems is thus not based on power but on inspiration, creating enthusiasm, and building trust among a diverse set of ecosystem partners. Successful leaders in ecosystems exhibit traits that are quite different from traditional leaders. They tend to focus on humble leadership and have a willingness to admit mistakes and failures. They focus on listening and showing empathy.

For legacy organizations, an important risk lies in trying to participate in an ecosystem but adhering to traditional forms of leadership. Traditional leadership strategies and mindsets do not work in an ecosystem environment. Adapting strategy and leadership approaches to the new environment are key for successful ecosystem participation and leadership.



CONCLUSION

Ecosystem orchestration is a way to facilitate, coordinate, and support the efforts of various participating actors toward a shared goal. This role can be carried out by an individual, a team, or by an organization. Effective ecosystem orchestration involves balancing the needs and interests of all stakeholders and resolving core tensions between control and openness of the ecosystem, therefore a holistic approach to orchestration is suggested.

How an ecosystem is orchestrated is heavily context-dependent. We have attempted to generalize and differentiate on the level of the type of ecosystem. The key aspects are summarized in the table below:

	Knowledge ecosystem	Entrepreneurial ecosystem	Innovation ecosystem	Platform ecosystem
<i>Who is orchestrating?</i>	Individual(s) representing an organizational entity	Support or hub organizations	Hub actor/ecosystem leader	Platform owner/leader
<i>What are the desirable outcomes?</i>	Generation of new knowledge; knowledge transfer; and practices on how to organize knowledge.	Fostering collaboration and innovation; development of new technologies, products, and services.	Technological advancements and innovations; solutions to complex challenges.	Growing user base; increasing variety of services; continuous engagement.
<i>What are the most notable practices?</i>	Facilitative and enabling approach; resource allocation; setting up meetings and events.	Creating favorable infrastructures; building a community culture; and encouraging entrepreneurial pursuit.	Alignment and coordination; integration of complementary organizations; strategic direction and vision.	Platform design; API and standardized rules; supporting generativity; balancing stakeholder needs.

As discussed in this report, there are certain challenges as well as opportunities with ecosystem orchestration. It is important to reflect on whether, first of all, the ecosystem model is suitable for you and then whether it makes sense to invest time and resources into building a new ecosystem or to join an existing one. Similarly, it is also valuable to reflect on whether and which



orchestration model is suitable for the ecosystem you are a part of – are we orchestrating knowledge, entrepreneurial efforts, innovative inputs, or platform interactions (or several of them)? Who should the orchestrator be? Does it make sense for a lead actor to be the orchestrator or for a few actors to collectively orchestrate (or in “rotation”)? Will you be leading the ecosystem, orchestrating the ecosystem, or both? We hope that you can use this report and our findings to guide your understanding of ecosystems and their orchestration.



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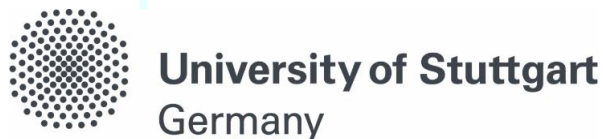
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