

Taking the pulse of service ecosystems: exploring viability through valences and forms of becoming

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Abstract

Purpose – Service ecosystems are arenas for value co-creation, yet how and why they become (un)viable over time remains underspecified. This study explores how service ecosystem viability unfolds through the interplay of valence (positive-negative) and forms of becoming (building-dwelling).

Design/methodology/approach – Drawing on a rich palette of qualitative data from a single-case study of a two-year open-innovation initiative in the Netherlands in a tightly regulated, high-tech public-business context, we scrutinize how intra- and inter-organizational dynamics evolve within and contribute to the viability of service ecosystems.

Findings – The findings reveal that intra-ecosystem interactions and performative landscape factors – including institutional arrangements, rules of engagement, legislation and inter-ecosystem trade-offs – episodically shape the viability of service ecosystems. Critically, actors' relational embeddedness and awareness strongly influence the viability of the service ecosystem.

Originality/value – Theoretically, the study advances service research by offering a process-sensitive account of viability as a dynamic interplay of bright-dark valences and building-dwelling becoming. We propose an integrative framework with theoretical and empirical cues for tracing service ecosystem viability episodically. Managerially, the study offers pathways and warns of pitfalls in “wayfinding,” fostering organizations' capability to navigate resiliently in service ecosystems.

Keywords Service ecosystems, Viability, Valences, Forms of becoming, Bright and dark side

Paper type Research article

Introduction

Organizations are nested in dynamic service ecosystems, defined as self-adjusting systems of resource-integrating actors, connected by shared institutional arrangements and mutual value creation through service exchange (Lusch and Vargo, 2014; Vargo and Lusch, 2016). Value co-creation dynamically evolves over time as actors rally in service ecosystems to integrate resources in multilevel processes (Chandler *et al.*, 2019; Vink *et al.*, 2020). In such complex service settings, the full range of actors and underlying institutions contribute to generating



novel solutions that facilitate the diffusion of sustainable innovation over time (Chandler *et al.*, 2019; Vargo *et al.*, 2020). Interorganizational relationships can leverage and complement actors' own competencies, amplifying value co-creation and increasing the likelihood of successful innovation in ecosystems (Greco *et al.*, 2020; Möller, 2006; Möller and Halinen, 2017). Exploring value co-creation in service ecosystems echoes its priority in the service realm (Donthu *et al.*, 2022; Field *et al.*, 2021; Vargo and Lusch, 2016).

Service ecosystems, however, are not always thriving (Gummesson *et al.*, 2019). Outcomes of value co-creation in service ecosystems might also be adverse or negatively valenced (Vargo *et al.*, 2022). While these are inherent to interactor relationships (Håkansson and Snehota, 1995), research tends to adopt an optimistic lens, falling prey to a positive bias (Mustak and Plé, 2020). "Negative" could refer to the – de facto normal – opportunistic behavior of organizations, interorganizational tensions or divergences (Chandler, 2025; Chowdhury *et al.*, 2016; Lumineau and Oliveira, 2018). A more realist view on service ecosystems is warranted, with acknowledgment of the "dark side" of interorganizational relationships (Oliveira and Lumineau, 2019) and value co-creation and co-destruction (Bruce *et al.*, 2019; Skälén, 2026). In theorizing service ecosystems, it is critical to take value co-creation and co-destruction seriously, as they function as valences of value that determine increases or decreases in systems' viability (Peters, 2016) or their well-being (Laamanen and Skälén, 2015; Muñoz-Martínez, 2026).

Despite this consensus in service research, the underpinnings of service ecosystem viability remain underspecified. In particular, the mechanisms of transformation *toward* (i.e. how a service ecosystem comes into being) and *within* (i.e. how heterogeneous service ecosystem components, such as actors and resource integration activities, contribute to their survival or decay) service ecosystems are ill-grasped. These *forms of becoming* – both the initial efforts that establish a service ecosystem and the ongoing activities that further evolve it – have received little attention. Against this background, our objective is to explore service ecosystem viability by unpacking its dynamics, namely *valences* and *forms of becoming*. Neither lens suffices alone. Where valence identifies whether interactions tilt bright or dark, they do not disclose how they arise. Becoming traces how activity emerges, through building or dwelling, but not with what valenced effect. Therefore, we argue that their intersection reveals the mechanism of viability that scholarly work to date has left untouched.

Valence has been a recurring theme in service business (Abosag *et al.*, 2016; Li *et al.*, 2018; Sharma *et al.*, 2022; Struwe and Slepnirov, 2021) and interorganizational relationships (Dekker, 2004; Oliveira and Lumineau, 2019; Sydow *et al.*, 2017). Valence is typified by positive and negative, acknowledging that actors face instances of "plain sailing," challenges and friction. Forms of becoming, typified by "dwelling" and "building" (Chia and Holt, 2006; Chia and Rasche, 2010), address respectively how "things" naturally emerge through actors' non-deliberate engagement or artificially appear through actors' purposeful strategic activities.

Empirically, we draw on a single-case study of open innovation in a high-tech public-business context consisting of multiple bilateral relationships. We analyze how a service ecosystem is built and maintained and explore intra- and inter-organizational interactions through our participative engagement during and after the completion of an innovation project. We ensured sensitivity to organizational, bilateral and multiorganizational (ecosystem) interests. The findings illustrate the dynamics of an innovation service ecosystem embarking on a collective journey yet ending up with limited, merely bilateral, results. Engagement in dynamic service ecosystems unfolds across a matrix of valences and forms of becoming. We find that episodes unfold dynamically, highlighting the role of actors' awareness of and positioning in terms of engagement, transformation and innovation – ultimately affording service ecosystems' viability.

We make three contributions to service theory on the viability dynamics of service ecosystems. First, we expose how positive (bright side) and negative aspects (dark side) (e.g. McColl-Kennedy *et al.*, 2020; Mele *et al.*, 2018) of valence co-exist, adding granularity to the viability of service ecosystems (Peters, 2016; Polese *et al.*, 2021; Vargo *et al.*, 2022). Second, we introduce and theorize forms of becoming as a lens for explaining service ecosystem

dynamics and evolution (Akaka *et al.*, 2025; Thompson-Whiteside *et al.*, 2023). Finally, we coalesce valence and forms of becoming in an integrative framework (Figure 1) that provides theoretical grounding and could underpin normative guidance for understanding and designing service ecosystems (Vink *et al.*, 2020).

This paper is structured as follows. First, we theorize on value co-creation in service ecosystems and propose a theoretical foundation to view value co-creation in an integrated manner, that is, through forms of becoming and across valence. We outline our methods and provide the findings in three distinct sections. Next, we discuss contributions and implications to the service field and suggest implications to practice and avenues for further research.

Conceptual lens

We build our conceptual lens cumulatively. We commence by discussing the status quo on value co-creation and service ecosystems. Next, to theorize how service ecosystems are in the making, we discuss forms of becoming. Subsequently, we unpack how viability of the ecosystem could be subject to change through valences. We close the section by coalescing the forms of becoming and valence into a framework that makes service ecosystem viability analytically and theoretically tractable.

Value co-creation and service ecosystems

Value co-creation has become, especially over the last 2 decades, a central and prominent research topic in service research (Donthu *et al.*, 2022; Wetzels *et al.*, 2023). The Service-Dominant (S-D) logic views it as the dynamic process through which multiple actors – often unaware of one another – jointly contribute to an actor’s and/or a system’s well-being (Vargo *et al.*, 2022). Value is always co-created, phenomenologically experienced and determined by actors in the process of service exchange and resource integration (Vargo and Lusch, 2016). Value co-creation is underpinned by and emerges from the practices and experiences at the individual and collective level (Kelleher *et al.*, 2019). S-D logic posits that *de facto* a multitude of actors engage in service exchanged based on reciprocal value propositions (Baumann *et al.*, 2017; Skålén *et al.*, 2015).

S-D logic increasingly views value co-creation from a systemic perspective (Chandler and Chen, 2016; Nenonen *et al.*, 2018), explaining the surge in research into service ecosystems. In this, it is generally accepted that value arises from interactions among strategic networks of actors (Matinheikki *et al.*, 2017; Möller and Halinen, 2017). Ecosystems form the arena in which value co-creation manifests (Akaka and Vargo, 2015; Meynhardt *et al.*, 2016). Actors and their resources – nested in institutions that shape the utility of such resources (Koskela-Huotari and Vargo, 2016) – connect for service exchange, enabling novel resources and outcomes to emerge for value co-creation and increased actors’ and system well-being (Chandler and Vargo, 2011; Vargo *et al.*, 2022). Lusch and Vargo (2014, p. 161) coined the notion of service ecosystems, which are “relatively self-contained, self-adjusting systems of resource-integrating actors connected by shared institutional arrangements and mutual value creation through service exchange.” Service ecosystems are nested at various levels of aggregation (Baker *et al.*, 2022; Koskela-Huotari *et al.*, 2016), requiring orchestration (Kelleher *et al.*, 2020). They are analytically different but ontologically inseparable and incorporate micro-meso-macro and cross-level analysis (Vargo *et al.*, 2023) with associated multilevel governance processes (Spohrer *et al.*, 2012). Service ecosystems are complex clockworks: they comprise interdependent assemblages of distinct institutional arrangements, i.e. “the interdependent assemblages of institutions – which are the rules, norms, meanings, symbols, practices and similar aides to collaboration” (Vargo and Lusch, 2016, p. 6). Interactions within service ecosystems are enabled by these institutional arrangements (Polese *et al.*, 2021), underpinned by actors’ behavior, practices, expectations and assumptions (Baker *et al.*, 2022). Given their dynamic, emergent nature, we treat service ecosystems as

performative, that is, always in *the making*. Ergo, if an ecosystem is accomplished through ongoing activity rather than given, then any account of its viability requires a vocabulary for how that accomplishment happens. We suggest that forms of becoming supply this vocabulary. To further unpack this, we theorize how this making unfolds through forms of becoming.

Service ecosystems in the making? “Building” and “dwelling” viability

Viability as a service ecosystem concept refers to the aggregation of organizational value co-creation (Wieland *et al.*, 2016) that contributes to the service ecosystem’s well-being (Laamanen and Skålén, 2015; Muñoz-Martínez, 2026). Service ecosystems are dynamic as they are performed: they are malleable and adapt over time. They “evolve” (Akaka *et al.*, 2025) through change that occurs nonlinearly and dynamically. This allows some service ecosystems to thrive, while others may wither away (Meynhardt *et al.*, 2016; Vargo *et al.*, 2008). We are interested in interactions in complex and dynamic contexts that may transform business exchanges into a service ecosystem. To understand how this is brought about, we draw on organization theory literature and infuse the notions of “building” and “dwelling.” These help to understand organizational learning (Chia, 2017) strategy making (Chia and Holt, 2006) and social life from the perspective of the systems we humans create and cultivate (Chia and Holt, 2009). In discussing building and dwelling as epistemologically different modes of becoming, we embrace the view that becoming is a fundamental feature of everyday reality (Chia, 2017; Chia and Rasche, 2010). In essence, social entities, categories and distinctions are not ready-made or objectively “out there.” They emerge as effects of social (inter)actions (Chia, 2017). This fits with the idea that interaction causally empowers new elements to arise, which are not directly attributable to those from which they emerge (Vargo *et al.*, 2022). Departing from such process-philosophical worldview, which underlies the entire practice family (Nicolini, 2012), reality is perpetually fluxing and changing, that is, *becoming* (Chia, 2017). We further delineate forms of becoming below.

First, *dwelling* presupposes a non-deliberate and practical engagement manifesting through an actor’s internalized modus operandi (Chia and Holt, 2006). The world, social order and organization emerge through actors’ everyday purposive-practical coping in socio-material actions and interactions (Chia and Rasche, 2010). This type of becoming, in the sense of coping, is primordial to any form of existence or representation (Chia and Holt, 2006; Nayak and Chia, 2011). Rather than presenting itself as “ready-made,” the world comes into being and takes on significance through its incorporation into everyday activities (Chia and Holt, 2006; Ingold, 2021). “Things” thus do not emerge through prior planning or intention but rather as something immanent to everyday practical coping (Chia and Holt, 2006).

Second, *building* assumes that actors deliberately engage in the world through purposeful behavior and thought (cf. Chia and Holt, 2006). Building as a form of becoming involves conscious, often collective behaviors such as developing concepts, imagining and planning. Primacy is given to intentional states and individual motivations with a presumed detachment between the actor and the external world, mediated by language, symbols, rules and procedures (Chia and Holt, 2006; Chia and Rasche, 2010). Actors are separate entities within an identifiable context whose characteristics can be comprehended in a causal, law-like fashion, enabling strategists to detail the organization’s present and future and how to move between these conditions (Holt and Sandberg, 2011). Moreover, actors are separable from their worldview; they have the power to reconfigure the world to their own design (Holt and Sandberg, 2011). “Things” thus emerge through self-consciousness and are guided by prior mental representations (Chia and Holt, 2006). Thereupon, one may assume that actors build before they dwell. However, only if actors are capable of dwelling they can build (Chia, 2017; Heidegger, 1971). Building itself may fail, although initially imagined service ecosystem ideas may seem attractive (van der Maarel *et al.*, 2025; Perry-Smith and Mannucci, 2017; Tang *et al.*, 2025). Forms of becoming, however, are directionally uncharged. In other words, the same mode can accompany an ecosystem that flourishes and one that erodes. To examine viability,

we therefore need a complementary vocabulary, one that registers whether ongoing activity tilts the ecosystem toward well-being or its deterioration. We therefore turn to valence for this.

Service ecosystems viability at risk: exploring valence

Service ecosystems seem a desirable platform for organizing value co-creation. They rely on relationships (Kelleher *et al.*, 2020) and institutional arrangements to function (Vargo *et al.*, 2017). Building new service ecosystems is a holistic endeavor (Vink *et al.*, 2020). It implies reflecting on their potential viability, including how they are embedded in relationships between organizations. Institutions are to be reconciled in a new manner (Chandler *et al.*, 2019). Such relationships are contractual and, in some cases, informal. Misalignment of collective goals (Gümüşay *et al.*, 2020b), tensions (McColl-Kennedy *et al.*, 2020; Tóth *et al.*, 2018) or institutional divergences (Chandler, 2025) can jeopardize resource integration, eventually resulting in negatively valenced value co-creation (Vargo *et al.*, 2017), akin to value co-destruction (Lumivalo *et al.*, 2024). Awareness of and management of the dimensions of value co-creation are critical. It complements a focus on the positive side (Abosag *et al.*, 2016) and can contribute to, for example, success of interorganizational journeys and well-being at multiple levels within service ecosystems (Ranjan *et al.*, 2024). The key indicator here is *valence*, which represents the degree to which an issue, such as value co-creation, unfolds or is framed positively or negatively (Mittal *et al.*, 2002; Vargo *et al.*, 2017).

Considering valence in complex settings such as service ecosystems is inevitable. The literature indicates that the dark side is inherent in inter-organizational and business relationships (Abosag *et al.*, 2016). Inter-actor collaboration is complicated and fragile (Carida *et al.*, 2022) and prone to power dynamics, such as relationship asymmetry (Cuevas *et al.*, 2015), across different “typecasts” (Hogg, 2023). Interorganizational misfits are common; in fact, most interorganizational alliances fail (Ariño and de la Torre, 1998; Gulati *et al.*, 2012). Furthermore, collective goals or shared institutional arrangements are not always a given (Gümüşay *et al.*, 2020a; Gümüşay *et al.*, 2020b). Several types of tensions may occur in value co-creation contexts across all layers of service ecosystems (Chandler, 2025; Chowdhury *et al.*, 2016; McColl-Kennedy *et al.*, 2020; Tóth *et al.*, 2018). Resources are not always successfully integrated, leading to negatively valenced value co-creation (Vargo *et al.*, 2017). Ergo, the dark side of interactor collaboration is multifaceted. It could be mapped onto a spectrum ranging from tolerable (e.g. adaptation in routinized conflicts) to intolerable (e.g. opportunistic behavior terminating business relationships) (Abosag *et al.*, 2016).

While scholars in interorganizational and business relationship communities have devoted attention to investigating the dark side (e.g. Abosag *et al.*, 2016; Chowdhury *et al.*, 2016; Tóth *et al.*, 2018), research in service ecosystems has mostly adopted an idyllic/bright lens – risking to fall prey to a “positive bias” in theorizing (e.g. Mustak and Plé, 2020; Oliveira and Lumineau, 2019). Few studies have explored service ecosystems by illuminating and conceptually integrating the dark side. McColl-Kennedy *et al.* (2020) studied tensions and trade-offs in service ecosystems and showed that differing worldviews, roles or practices negatively affect outcomes. Mele *et al.* (2018) delineate conflict, ambiguity and opportunism as three facets of agential behavior, being a vital function of how actors shape service ecosystems. Hogg (2023) further underscores this by highlighting power strategies within the service ecosystem and between actors.

Value co-creation can possess both a positively and negatively valenced character. Valences can be viewed as distant, positive or negative, qualifications of outcomes by certain actor engagement (van Doorn *et al.*, 2010; Li *et al.*, 2018). Positively valenced change is associated with positive novel outcomes contributing to value co-creation in the service ecosystem. A typical example is the surge of positive outcomes of the service experience economy (Pine and Gilmore, 2011). Negatively valenced value co-creation takes place when novel outcomes deteriorate the service ecosystem. This can, for example, occur through non-

harmonious aspects in service ecosystems and poor experiences (Echeverri, 2021), eroding the collective well-being of actors. Valence determines the net balance of actor engagement and can occur at the individual level (e.g. cognitive evaluations or feelings) as well as the collective – ecosystem – level (e.g. social norms and shared beliefs) (Li et al., 2018; Nakintu et al., 2025). There may be first- and second-order effects within valences. For example, in instances of institutional dissonance (Chandler, 2025), first-order effects may appear negatively valenced (e.g. friction or resistance to change) but turn out to be positively valenced at the second-order level (e.g. altering norms, values and behavior that eventually catalyze innovation).

In terms of valence, bright perspectives on ambitions and on the functioning of the service ecosystem tend to prevail. This makes sense co-production and desirable collective advantages attract engagement (Fehrer et al., 2024; Nabatchi et al., 2017). Yet remarkably, “relationships that appear to be doing well are often the most vulnerable to the forces of destruction that are quietly building beneath the surface of the relationship” (Anderson and Jap, 2005, p. 75). Thus, further exploring the dark side in service ecosystems coheres with the nature of service ecosystems in which hidden rules, beliefs and norms are at play (Vink et al., 2020). Neglecting the dark side hinders further formalization and development of S-D logic and recent calls point out the need for further nuanced and critical research into service ecosystems (Mustak and Plé, 2020). So far, limited studies have explored the dark side of service ecosystems. After all, they disrupt a status quo – including ending some value co-creation (Feddemma et al., 2025) – and generate new business relationships that hardly prove beneficial to all actors (in)directly involved. Relational problems may arise (Vargo et al., 2017). Central actors may play a pivotal role and optimize their interests (Baron et al., 2018). Even though this may represent a laudable cause of collective value, it could have adverse effects (Kumar et al., 1998). Value co-destruction may occur, both in “actor–actor interaction,” and within individual organizations (Lumivalo et al., 2024). For instance, a service ecosystem and its proposed value concept may jeopardize organizational earning models, thus immediately activating stakeholders. As a multilevel problem, institutionalized value-creating structures may be at risk (Beirão et al., 2017; Lepak et al., 2007). Different logics may clash, increasing institutional complexity (Gümüşay et al., 2020b; Jaakkola et al., 2019). Considering service ecosystems as interorganizational innovation draws attention to both the advantages of collaboration and the wider implications for participants and non-participants (Oliveira and Lumineau, 2019; Oliver, 1990). Extant mindsets, interorganizational power and management of interests may change in a negative manner (Hogg, 2023; Koskela-Huotari et al., 2024). Valence of the aggregate of a service ecosystem may deviate from actor valence. Governance may not arise, and interactions could drift away from collective ambitions without new elements materializing (Vargo et al., 2023). This denies a service ecosystem its institutional and processual foundation for viability (Beirão et al., 2017). Next, we coalesce forms of becoming and valence in the context of service ecosystem viability.

Toward an integrative framework for service ecosystem viability

We consider the dimensions of valences (positive-negative) and forms of becoming (building-dwelling) as a useful conceptual apparatus for deepening knowledge of how service ecosystems develop and wither (Thompson-Whiteside et al., 2023; Vargo et al., 2022). Indeed, the viability of the service ecosystem only becomes intelligible when considering the valences and forms of becoming temporally. Open ends remain in how value co-creation unfolds, both positively and negatively (Vargo et al., 2017). As this is a critical aspect of business relationships (Samaha et al., 2011), managers seek concepts and tools to deal with both sides of valence. Hence, researchers have an opportunity to reflect and study how these come about. Against this backdrop, we arrive at the framework shown in Figure 1 to analyze building and dwelling as positively and negatively valenced phenomena.

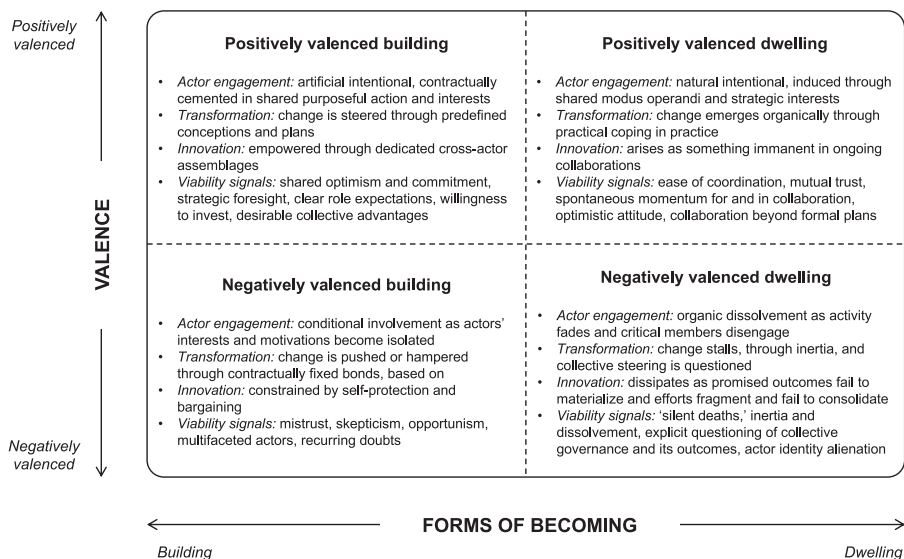


Figure 1. Service ecosystem viability dynamics: valence and forms of becoming

Each cell in the framework presents a distinct mode of how service ecosystems are in the making. Cues – structured according to the analytical cues of actor engagement, transformation, innovation and viability signals – characterize each cell and enable further exploration, conceptually and empirically, of service ecosystem viability. Specifically, actor engagement entails a relational process between actors; transformation is processual and systemic, innovation can be understood as an outcome of the aforementioned, and finally, viability signals can be viewed as a diagnostic reading of the service ecosystem’s state. The cues put the previously mentioned theory of forms of becoming and valences to work in the context of the service ecosystem. The four-cell framework thus serves as an analytical heuristic for our empirical work (Dubois and Gadde, 2002). Rather than being two dichotomic modes, positive-negative and building-dwelling exist on a continuum. We foresee cross-cell transitions in service ecosystems due to the dynamic character of both the ecosystem, bilateral relationships and intra-organizational dynamics. This can be considered a struggle of institutionalization: will different logics cohere and will a viable trajectory emerge (Jaakkola et al., 2019). Next, we present an empirical case of service ecosystem innovation, showcasing the dynamics mentioned above.

Methods

Empirical setting

We draw on a single case in the Netherlands in a high-tech open innovation context to scrutinize how intra- and inter-organizational dynamics evolve. The case captures a service ecosystem as it is initiated and reworked over time, making it suitable for observing how it is built and maintained, and how it may wither. This performativity of the service ecosystem reveals how it proves (or fails to prove) viable. We gained access – through well-established professional networks and projects – to this service ecosystem initiated by a major public organization, which we refer to as ArCo. This organization uses advanced technologies to support complex crisis response activities. ArCo initiated a strategic cooperation program to transform its bilateral exchange relationship with seven (sub)suppliers into a more relational-cooperative phenomenon. As an example of this shift away from a highly institutionalized

transactive way of organizing customer–provider relationships, a two-year project called BusIntel was initiated. This project is the (attempted) service ecosystem we studied. ArCo explored in the BusIntel project ways to increase information transparency in spare supply chains, piloting digital artifacts and new practices. One author participated in the project from its start as an academic, with full access to meetings, site visits and project documents.

BusIntel was organized as an open innovation project, with a consulting firm (referred to as SerCo) contributing to the project organization. Participating organizations included ArCo, SerCo and seven suppliers of ArCo; anonymized references: TRSCo, TRDCo, PLCo, VHBCo, RNBCo, ZWCo and SECo. Links with universities were leveraged to create multiple research projects. In addition to these stakeholders, some extant suppliers and sub-providers of ArCo participated. The initiative to co-participate in an open innovation project was groundbreaking for ArCo and its (sub)providers. So far, relationships have been organized according to strict institutionalized rules for public procurement, leading to a bilateral, transaction-oriented mode of exchange. Innovation tended to be an intra-organizational endeavor. The project was structured around meetings, corporate experiments, consultant work and sub-research projects that were typically conducted as internship-thesis research.

Research design

This study follows an abductive research design (Dubois and Gadde, 2002), grounded in theory and empirics and is especially well-suited to developing theory that is both novel and practical (Nenonen *et al.*, 2017; Vink and Koskela-Huotari, 2021). The unit of analysis was the BusIntel project, with additional access to ArCo as an embedded unit of analysis (Yin, 2015). We continuously traveled back and forth between the data and theory (Dubois and Gadde, 2002) to deepen our understanding of attempts to develop service ecosystems. While our research design has been abductive, our role as researchers evolved: from one that was participatory during the project and focused on *in situ* activities, to one that was more contemplative and retrospective afterwards (Bergold and Thomas, 2012). We had access to the open innovation project mentioned, as SerCo asked one of the authors to participate in it in a role framed as a (non) participative researcher. Our engagement in the project lasted from 2013 to 2017.

Our initial role as qualitative researchers was to insert a research perspective, reflect on the project process and support the project in a research sense with university resources. We engaged in the project with an open mind and in an “introverted” fashion, collecting basic data while absorbing novel experiences and developing new insights into the professional “habitat” of the ArCo-supplier ecosystem. The engaged researcher conducted unobtrusive observational research, as a “fly-on-the-wall,” meaning there was no intervening or facilitating (i.e. no action research). Later, a researcher from another university was also invited. Over time, our engagement built rapport (Fetterman, 2019; O’Reilly, 2012) with the actors in the ecosystem, helping us conduct additional interviews and hold informal conversations upon project completion. This deepened our analysis, helping us make sense of behaviors during the project.

Our research agenda emerged with a growing interest in the bright-dark sides and the becoming of the service ecosystem, making our role more extravert in a retrospective sense. Ex-post conversations with project participants confirmed the complex, layered agendas driving actors in the service ecosystem. The abductive approach enabled us to return to the field to conduct additional data collection and gain a better understanding of what had happened. For example, in instances where omissions or ambiguities arose in the theory development (Eisenhardt, 1989), we organized additional interviews after the project with multiple key stakeholders and ensured comprehensive ex-post documentation collection in cooperation with ArCo. Organizing this was a smooth process thanks to our close connections with key actors in the service ecosystem.

Data collection

A diverse set of qualitative data was gathered through participative research and ex-post data collection and analyzed following abductive research principles. A logistics research institute and

a national scientific research organization facilitated the BusIntel project. One author unobtrusively attended almost all project meetings as a non-participatory observer with no formal role or responsibilities in the project. His involvement was limited to observing and taking field notes. Given his rapport with project participants, the researcher was able to ask questions without disrupting project practices. This enabled gaining an in-depth understanding of the project's ideas and participants' cognitive-emotional engagement journeys. While engagement was unobtrusive, the researcher remained reflexive about his potential influence on project participants through awareness, transparency and reflection. The other authors, from academia and an organization related to ArCo, were engaged in ex-post data collection. Rallying the insider (emic) author's experience and the outside (etic) authors' critical examination (Fetterman, 2019) enabled reflection with fresh eyes and cross-checks on the data, eventually creating deeper insight into the BusIntel project. To enhance reflexivity (cf. Fetterman, 2019), the non-participatory researcher separated descriptive notes from interpretations, juxtaposed them with interviews and documents and challenged emerging insights with co-authors during "data sessions" (Knoblauch, 2005). This enabled all authors to refine their insights through data triangulation. Our data collection spanned the two-year project and continued afterward with the two additional authors (e.g. reflective interviews and informal conversations). We relied on a variety of data sources, as shown in Table 1. Abbreviations in square brackets help code data, locate quoted or referenced data in this paper and ensure traceability for follow-up questions. We treated interviewees and data responsibly, detailing, for instance, the anonymization of data processing.

Analysis

Our analysis focused on a single case study, yielding in-depth insights and conceptual generalizations (Di Pietro *et al.*, 2018). This generalization evolved from conversations among the authors and with our network. We developed converging insights into the evolution of the service ecosystem and explanatory insights that combine positive and dark aspects across different forms of becoming. The analysis encompassed an iterative – abductive – process. While continuous sensemaking occurred throughout the project, data analysis was conducted *a posteriori*. In fact, during the project, the dark side did not receive managerial and research attention; it took a while to realize what was going on, i.e. reflexivity.

Our analysis proceeded in three stages. We first moved from raw material to episodes by coding interviews, observations and documents against the four analytical cues (engagement, transformation, innovation, viability signals) and temporally bracketing (see Langley, 1999) critical moments of change into episodes as the unit of interpretation. We then read each episode through the integrative framework, positioning it along valence (bright-dark) and form of becoming (building-dwelling). Finally, we compared across episodes, tracing trajectories and cross-cell transitions over the project's lifespan, to derive the pathways and pitfalls that anchor our final model. We structured and organized our data in NVivo. All data were coded for content analysis based on a set of codes from our theory (see Table 1). The cues in each cell of the integrative framework (Figure 1) helped us structure our thoughts throughout the coding process and assisted in further refining *a posteriori* data-collection moments. Equipped with our theoretical apparatus, descriptive data led to explanations of the dynamics of service ecosystem evolution (Dubois and Gadde, 2002). We identified episodes with corresponding descriptive elements and positioned them into the integrative framework. We first temporally bracketed critical moments in the service ecosystem evolution that constitute a change of some sort. In doing so, we did not yet look at the valence of these events but focused on their disruptive nature. Examples of these were the actual inception of the ecosystem, based on the project's initiation or changes in the ecosystem's character through shifts in the project's rhythm or vision. After describing these events in an explanatory fashion, we could categorize them – with the help of the theoretical analytical cues – into combinations of valence and forms of becoming (Figure 2). Positively valenced episodes were relatively evident to identify with

Table 1. Overview of data sources BusIntel project

Type of data	Details [internal reference code]
Notes, websites, generic information	• Public information on the ArCo initiated strategic cooperation program, the BusIntel project and suppliers [LVEW, SOGW, SIEW] • Press release [PLLW] • Interview SerCo consultants in public media [TENT] • Logistics research institute communications [SIPW] • Antitrust case before BusIntel involving suppliers [DELW] • Public information from former senior executive strategic cooperation program, retired from ArCo [HENW, LNSW]
Corporate documents pertaining to BusIntel	• ArCo internal briefings [RENT1, RENT2], strategic cooperation program [AKLT], conference proposal [IJET], announcement [SENW] • Logistics research institute briefing [DENT]
BusIntel project documents	• Vision [VICW], proposal [PRYT, PTYW], proposal appendix [PTYW], participation agreement [PICT, AICT], consortium agreement [AENW/AICW/CICW, intermediate communication AENW], partner agreement [AICW] • External ex ante appreciation [REWT], and rebuttal [WICW, RJWW] • Presentations: project approach [PRDT], update at SerCo [SIOT], student kick-off [KENT], SerCo internal presentation [PMDT] • Overview of proposals for experiments at participating organizations [VICW] • Final report [LGET, SRTW, FIEF] • Report on meeting with antitrust authorities [GITE]
Meeting reports	• Reports of steering group meetings 1 through 7 [VSTT/NICW no1, VICT/NALW/GALW/NSTW no2, SICT no7] • Reflection on meetings at ArCo [KNGW]
Reflective interviews and informal conversations	• Author with SerCo [JENW] • Follow-up communications on meetings [LDEW] • Former BusIntel coordinator who left ArCo [JNWT] • Former senior executive strategic cooperation program, retired from ArCo [INWV] • Former BusIntel project leaders still working at ArCo [interview and informal conversations, SALW, SILW, HENW] • Informal reflective conversations former project members ArCo • Participation in captain's dinner organized by ArCo for its provider community, including keynotes
Corporate experiments, student and consultant work	• Communications involving students studying various organizations, e.g. SerCo mail to students and project participants on data sharing [EAN, FOMW], experiments [BNTW, LMIW], and meetings [BRSW]; communications with or about students on experiments/ internship [DEXW, OIAW]; expectations from student coaches at universities [VENW] • Case study at ArCo and SerCo [GMMW, and interview IRSW/URSW], case study on a high-tech system [VAINW] • Proposal TRSCo [OVFW] • Internship-thesis assignment texts [VLLT, BART, BNTW, VYSW, VEKW, BMSW, VEKW] • Baseline explorative studies at PLCo [BCST, VCSW] • Student internship report/theses [AEFW/AOLW], SerCo report on thesis [FNSW] • Internship/thesis presentations [WIET, SENE, ENTT] • Consultant work [FIET] • Fact sheets (publicly available extended summary of an internship/ thesis): ArCo [SBSF], ZWCo [SAGF], PLCo [SOLE, SOKW, FMFP]

Source(s): Authors' own work

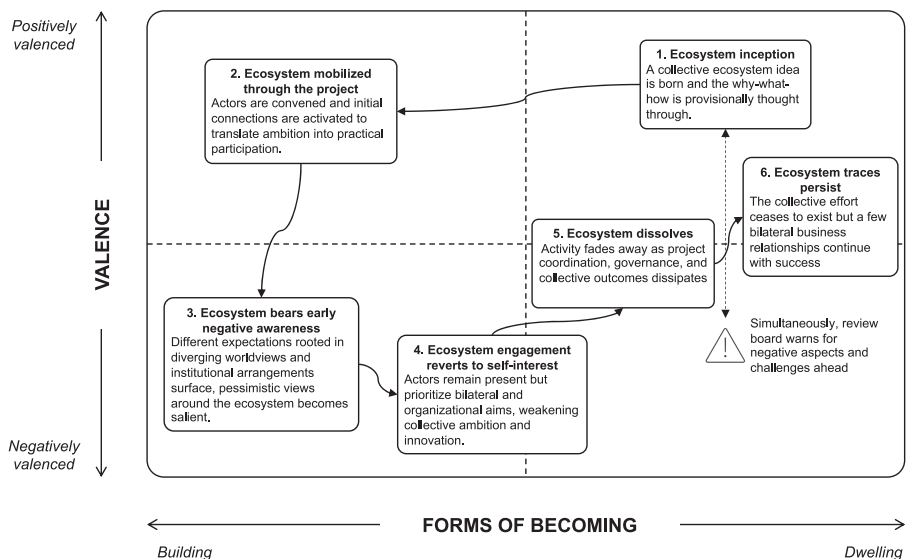


Figure 2. The BusIntel project: episodes of valence and forms of becoming. Source: Authors’ own work

the help of viability signals and the clear collective harmony in actor engagement and value co-creation in transformation and innovation. Negatively valenced episodes were identified through the associated viability signals as well as a general pessimistic ecosystem character, underpinned by destructive actor engagement, transformation and innovation. In identifying all episodes, we focused on the hierarchy of the ecosystem, while acknowledging that individual actors, bilateral relationships and the project influenced it. Negatively valenced episodes, however, proved more arduous because of their entrenchment in sensitive, politically laden organizational structures and interorganizational sensitivities. In short, (sub)providers wanted to join the dialogue on service ecosystems, but they focused on ensuring their organizations’ interests first. A posteriori informal conversations with people involved in the BusIntel project that probed into experiences and emotions were beneficial to uncovering subtleties and make the dark side more tangible and manageable.

Trustworthiness

Concerning trustworthiness criteria pertaining to case study research (Huikkola *et al.*, 2022), we paid close attention to several elements. First, we reflected on our distinct positions in a social and temporal sense. Second, the data set consisting of different data sources enabled triangulations, eventually ensuring credibility. Third, the reliability of retrospective data collection was grounded on theory-informed interview protocols (see [Online Appendix](#)). (Inter)dependability of insights was minimized through separate interviews. Finally, throughout the research, we ensured adherence to integrity principles by disclosing our interests and ensuring that research participants engaged voluntarily and flexibly.

Given the rich and expansive findings of this study, we develop upon them in three separate sections. First, we provide tales from the field on context and rules of engagement. Second, we zoom in on the episodes of service ecosystem viability. Third, we zoom out to the landscape of the service ecosystem.

Tales from the field on context and rules of engagement

The performative landscape demands awareness of actors' relational embeddedness and their resilient positioning. To develop on this landscape, we commence with tales from the field that narrate the rules of engagement of the BusIntel service ecosystem, paying particular attention to institutional arrangements nested in context. The BusIntel project materialized in a service ecosystem in a tightly regulated industry. We unpack this setting and explore societal and sectoral institutional arrangements. Moreover, we expand on intra-organizational institutional arrangements, with ArCo as the focal orchestrator, initiating and enacting the project. This undergirds our understanding of service ecosystem viability, in particular, the nuances of bright and dark. We first offer a context preface, after which we distinguish four types of institutional arrangements that shape value co-creation in the service ecosystem.

Context preface

The project can be considered a practical manifestation of building and maintaining the service ecosystem. At a strategic level, the project emerged from relationships with suppliers and SerCo. It departed from a transactional mode of exchange and embraced an ambitious scope encompassing horizontal-vertical value chains around ArCo. The project was designed as an open innovation research endeavor to initiate an ecosystem, following templates from a national research funding institute. Due to primarily public funding, results are disseminated without limits and for free: "Partners will take care of public availability and knowledge dissemination of the project results (excluding any confidential information), which includes making project results (on improved methods and procedures) and information digitally available on the internet free of charge" [AICW]. To be involved, parties had to match public funding. BusIntel parties included suppliers of trucks, operational systems and spare parts (repairables and consumables). The project and the broader contacts between ArCo and the industry can be considered part of the emerging service ecosystem. Our analytical locus, however, is limited to the BusIntel innovation project. During this project, some suppliers participated in a regular bidding process on TendProject, adhering to strict rules. This exacerbated their sensitivity to antitrust regulations, which are geared toward equal information provision to bidders, especially given the earlier antitrust authority intervention.

Societal context

The service ecosystem comprises public and private organizations operating in a market with stringent procurement regulations and heightened political sensitivity. Public procurement regulations – aimed at transparency, level playing field and national political accountability in a European setting – forcefully structure exchanges between ArCo and suppliers (Grilli and Webb, 2023). ArCo must adhere to elaborate European and national legal procedures to select and contract a supplier for a limited time frame. Antitrust regulations complement these institutional arrangements. Project participants learned from an earlier surprise visit of the national antitrust authority the importance of the rule that "sharing information between competitors can only concern aggregated, non-actual and anonymized information that is made available by a third party to the entire market" [GITF]. This visit instilled a clear sense of fear, which we encountered during project meetings. Within the provider organizations, internal legal, integrity and compliance actors imposed new rules to reduce future risks of violating the anti-trust ruling mentioned. In fact, awareness grew that compliance with this antitrust rule might clash with the need for longer-term cooperation between a public organization and suppliers of complex goods and services. Like similar public customers, ArCo attempts to combine arms-length procurement with some form of relational cooperation – the "Rhineland" model (Fleming, 2008) – to better achieve its objectives. This increasingly encompasses the exchange of data for advanced services. BusIntel explicitly checked with the authorities to learn how to deal with this paradox. To providers, the paradox on the public side

(do not cooperate – we want to cooperate) seemed puzzling. Both sides of these contradictory requirements (Smith and Lewis, 2011) were deemed strategically relevant.

Sectoral context

ArCo is used to procurement routines that adhere to legal rulesets, using its annually determined budget to contract large numbers of suppliers for massive volumes of goods and services. Relationships between ArCo and suppliers remained mostly transactional and based on recurrent tendering. In the BusIntel project, we encountered different logics: ArCo prioritized goods and services for its public task, while private firms focused on business continuity and profit. International firms offer technologies and services that include standard commercial goods, and goods partially or entirely customized for the ArCo line of work. Customization evokes unique value chains with low market volume, thereby influencing ArCo's and suppliers' engagement. In contrast, standardized spare parts avoid stock and lead-time problems. In addition, ArCo distinguishes between goods and services required for its national-European operations and those required for operations abroad. The former category increasingly relies on business-like servitization concepts, striving for efficiency. For the latter, ArCo emphasizes effectiveness and independence – hence it is not inclined to rely on direct supplier involvement. As mentioned, participants in the project experienced contradictory forces of being drawn together and keeping their distance. The former side of this paradox involves mutual dependence to achieve organizational goals; the latter concerns antitrust regulations that permeate each supplier organization (e.g. internal compliance departments and boards that tightly monitor BusIntel cooperation). In addition, ArCo enforced tight security restrictions. Overall, the sector has been suffering from sub-standardization: the same parts receive different product codes when built into various products. This dramatically complicates data sharing. Sectoral transparency is lacking, in part because it would jeopardize business models.

Extant contracting practices

ArCo has been experimenting in bilateral relationships with suppliers by exchanging information and resources on a limited scale. In general, sharing information between ArCo and its suppliers is cumbersome. To many suppliers, ArCo is a mysterious, closed and multifaceted organization. This motivated suppliers to join the BusIntel project: “companies just wanted to get information” [SALW, SILW, HENW]. On a small scale, ArCo did embrace bilateral performance contracts with suppliers (some involved in the BusIntel project) taking responsibility for stock levels at ArCo or their sites. “Since TRSCo performs maintenance, ArCo does not hold stocks. Stock optimization is achieved entirely within the TRSCo value chain (dealer – central TRSCo warehouse – sub supplier)” [ONAW]. The BusIntel project can be considered an attempt to extend this institutionalized practice by having ArCo further upstream with suppliers and seeking to combine multiple value chains horizontally. These extensions did not prove viable for numerous reasons: antitrust regulations, as mentioned earlier, threats to suppliers' earning models and new business opportunities, which we elaborate upon later. BusIntel's scope gradually shrank from multiple value chains toward small-scale non-horizontal collaboration (i.e. within particular chains).

Intra-organizational arrangements on behalf of ArCo

Finally, since ArCo as a customer, was the project's lead organization, we examine some of their own – intra-organizational – institutional arrangements. We noted that the organization struggled with excessive bureaucracy – “too many people having a say on processes” [MBSF] – lack of specialist knowledge, business process immaturity and limited transparency. Data processing for spare parts lacked standardization, and older data were not fully migrated to the new enterprise resource planning system. Internal exchanges

with ArCo's central procurement organization were similarly cumbersome, marked by divergent priorities and limited data sharing. Moreover, central procurement did not enforce component-level standardization, leaving suppliers to design to their own defaults [MBSF]. It must be very restrictive in sharing data on activities or resources, particularly when it operates abroad. On a positive note, ArCo and the purchasing organization have strived to shift toward new policies that rely on framework agreements, industry cooperation, stock transparency and integrated management of purchasing journeys. This ambition also resonated with the ArCo groundbreaking innovation program in which the BusIntel project was embedded, as well as a broader ambition to become an adaptive, externally networked organization. In response to complaints by multiple suppliers, ArCo attempted to "open its doors." It launched a comprehensive innovation program to collaborate with suppliers on multiple projects. This would foster learning from private sector culture and showcase ArCo listening to suppliers' negative experience of ArCo practices. The program was based on existing contracts and deliberately steered clear of ex ante legal agreements. ArCo flexed its customer power to engage suppliers in innovation projects. It emphasized room for multilevel interpersonal contacts across organizational boundaries to generate innovative ideas and practices.

Zooming in to episodes of service ecosystem viability

Our findings reveal that service ecosystem viability dynamically evolved across episodes, shifting between forms of becoming (dwelling and building) and valences (positive and negative). The BusIntel project was intended as an experimental space for interorganizational (ecosystem) innovation to improve the availability of technologies at ArCo. After this initiation, the project evolved dynamically. We plotted the six distinct episodes of service ecosystem viability in the valence and forms of becoming matrix (Figure 2).

Each episode contains dynamics regarding actor engagement, sentiment, tensions and institutional arrangements. The episodes are described in further detail in Table 2, including cues from our data.

Zooming out to the landscape

A service ecosystem's performative landscape

When zooming out, we observed that a service ecosystem does not exist in a vacuum. Instead, multiplex engagement involves balancing stakes and resources, involving a thin line of trade-offs and tensions when organizations enact their interorganizational engagements. This has consequences for the evolution and, concomitantly, the viability of service ecosystems, which are complex and sometimes opaque. When zooming out to examine how actors sought to institutionalize a "new normal," we see that the service ecosystem dynamically evolves and transforms over time. We present this "arc" of transformation in Figure 3.

We see that while service ecosystems strive to identify new opportunities (i.e. exploration), consolidate (i.e. exploitation) and move toward a new normal, the intended course may be altered, leading to value destruction. Intra- and inter-actor dynamics, as well as inter-ecosystem, may cause severe pressure on such attempts. Interestingly, while our case shows that the ecosystem eventually dissolved, actors cherished the positive residue of earlier efforts, which may generate new opportunities to build other service ecosystems.

In reflection, we identify this landscape as the performative landscape of service ecosystems and inter-ecosystem relationships constituted by reciprocal relationships between the BusIntel ecosystem and the broader arena in which actors operate. Such contexts cannot be considered merely stable; they are continually changing. They are driven and impacted by multiple factors. As also insinuated in service literature (Lusch and Vargo, 2014; Suzuki and Yamauchi, 2018; Vargo et al., 2023), service ecosystems have a performative character (Barad, 2003). Such a "performative landscape" encapsulates different levels of aggregation

Table 2. Evolution of episodes in the BusIntel project and data cues

Episode	Description	Cues in BusIntel project
1. Ecosystem inception	Informal relationships and an optimistic attitude among actors characterize this episode. The initial group of actors emerged from a few like-minded senior staff with a shared vision of improving communication and coordination within their partnership network. This episode represents <i>positively valenced dwelling</i> . Simultaneously, the review board warns of negative aspects and challenges ahead (typically depicting <i>negatively valenced dwelling</i>), which nevertheless is disregarded by personnel	• “Yes, it emerged spontaneously between an eager person and our chief, together with another party. Well, then we’re going to make this a success.” [Senior manager logistics, ArCo 1] • ““The industry cannot be trusted,” I heard around me. As if we, as ArCo ourselves, were always a trustworthy partner. Thus, we decided to work on trust. First the contacts, then the contracts. All lawyers were not happy, but it worked.” [Executive, ArCo 3] • “Yes, and in that way, it all started. It kind of grew organically. It wasn’t a preconceived plan.” [Senior manager logistics, ArCo 1] • Warning of negative aspects: “Sharing information across chains, especially commonalities, is one of the project’s intentions. However, this can only be done if it involves information that may be shared according to relevant laws and regulations.” [Director and senior account manager, SerPro 1]
2. Ecosystem mobilized through the project	The initial ecosystem group connects with a broader set of actors. The ambition of the ecosystem is delineated in a project plan, and formal relations within the ecosystem are developed and established. Although the journey only started and the path to success is still uncertain, the actors are optimistic. This episode depicts a transition from <i>(positively valenced) dwelling to building</i>	• “It is agreed to jointly draft a statement announcing the start of this project. This will include why these companies are at the table.” [Col 1] • “The intention is shared to commence the project with the premise that the services to be developed can be scaled up later. This is to avoid a situation where post-project there is a working concept, but no thought has been given to the preconditions for embedding this concept in existing business operations.” [Project leader, ArCo 2]
3. Ecosystem bears early negative awareness	First observations of negative thoughts and reasoning arise as it becomes obvious partaking in the ecosystem immanently entails disadvantages and unforeseen consequences. Furthermore, discrepancies in worldviews and expectations come to the surface. For example, regarding reciprocal information sharing: receiving information from other actors provides new insights, while sharing information with others may be simultaneously uncomfortable and conflict with own interests. This episode represents <i>negatively valenced building</i>	• “Everybody was in there out of self-interest.” [Project leader, ArCo 2] • “Quite frankly, the BusIntel project participants only participated so that each could be a discussion partner with ArCo. For them, it was a means of obtaining information. That BusIntel was used for other purposes was taken for granted.” [Senior manager logistics, ArCo 1] • “Initially, I had the idea that it was a very nice and ambitious project, especially for becoming efficient throughout the supply chain. However, we very quickly ran into irreconcilability, especially with the industry.” [Senior manager logistics, ArCo 1]

(continued)

Table 2. Continued

Episode	Description	Cues in BusIntel project
4. Ecosystem engagement reverts to self-interest	Over time, individual organizational actors wonder whether (engagement in) the ecosystem results in what they hoped for; is it going to realize their own goals? Actors seem to have a closed and self-centered mindset, and there is a reluctance to share information collectively. This hampers resource integration and value co-creation, ultimately withstanding the ecosystem to flourish. This episode predominantly illustrates <i>negatively valenced building</i>	• "... The partners were cooperating in one project, were competitors on another chessboard ... Yes, complicated. ... you were some sort of cartel-like construct." [Senior manager logistics, ArCo 1] • "Contacts between different partners in the project were under a magnifying glass at the board level. Afraid of being accused of cartelization." [Senior manager logistics, ArCo 1] • "One that wants to – and can – deliver everything [information]. Well, ArCo was open to everything. Other parties happily received it, of course. But the game at play, did we really have the same dot on the horizon? So to speak, yes, but in practice, you simply can conclude it was not the case." [Director systems, ArCo 4] • "At some point, the other project, which was really a big fish, popped up. I heard everyone thinking: "what for God's sake are we doing here? Soon we miss that one!" [Director systems, ArCo 4]
5. Ecosystem dissolves	The level of activity fades away; non-progress and the problem of minimal outputs linger on. Consequently, the future of the ecosystem is openly discussed. The disengagement of several vital members accelerates the dissolvment of the project and thereby the ecosystem viability as a whole. This episode manifests in <i>negatively valenced dwelling</i>	• "The project has died a silent death ... It all slowly passed by. I don't even know all details of how the project stopped. ... and if you look back, did we really learn something from it? No, in my view not." [Director systems, ArCo 4] • "The return was limited when you compare the result to the hours spent. ... Did the steering committee even function as a steering committee?" [Senior manager, PLCo] • "And then, at some point when the other project [referred to as TendProject] became prominent. Yes, then BusIntel fell apart like a sheet of loose sand." [Senior manager logistics, ArCo 1]
6. Ecosystem traces persist	In retrospect, the project did not yield ecosystem results that were promised and expected. Limited willingness and capability to openly share information and the differences in worldviews and institutional arrangements prevented the ecosystem from thriving. Still, some business relationships emerged, which continued with success and resulted in spin-offs. New insights such as awareness of the complexity of bright and dark sides of service ecosystems strengthen the organizations. This episode entails <i>positively valenced dwelling</i>	• "Through this project, however, it became crystal clear that transparency in the ecosystem depends especially on mutual trust, dependence, the type of contract and legal provisions and a solid cooperative mindset." [Director systems, ArCo 4] • "So yes, RNBCo continued to collaborate with VHBCo and succeeded in building a business relationship, even fixed in contracts. It was not the intention, but ok, they got to know each other and knew what they wanted." [Senior manager logistics, ArCo 1]

Source(s): Authors' own work

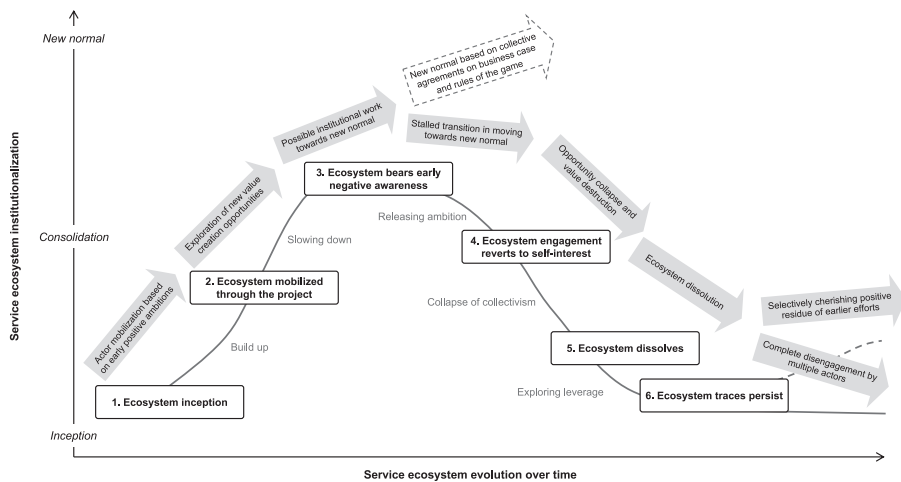


Figure 3. A service ecosystem transformation arc. Source: Authors' own work

that shape valence and forms of becoming, which, in turn, inform the broader landscape. Hence, the service ecosystem and its broader landscape are mutually constitutive.

Bilateral bidding or cooperating in a service ecosystem?

The findings enable us to now critically reflect on whether, in practice, actors truly cooperate from a collaborative ecosystem mindset or use the ecosystem instrumentally, to their own advantage. We observe that logics converged and diverged. They converge when institutional arrangements are shared, e.g. a legal and security logic; they diverge when logics clash due to diverse domains (public versus business) and levels of aggregation (organization – bilateral – ecosystem). Figure 4 depicts the BusIntel innovation service ecosystem involving multiple types of actors. While we claim that service ecosystems are fluid in their becoming and do not contain strict boundaries, we witness various ways of configurational fit (Storbacka, 2011; Storbacka et al., 2012) at multiple levels: intra- and inter-actor dynamics within the ecosystem and inter-ecosystem dynamics. Similar to multi-actor service ecosystems, where tensions can arise (McColl-Kennedy et al., 2020; Tóth et al., 2018), in BusIntel, inter-provider and customer-provider tensions emerged from different logics.

Tensions' articulation and awareness (i.e. actors' reflexivity) sharpened the relationship atmosphere (Waluszewski et al., 2009). They slowly progressed but remained rather implicit due to sensitive public–business relationships. The BusIntel project, geared to open innovation, conflicted with the TendProject, which was structured around a tendering process. Its major scale and business potential attracted BusIntel actors, redirecting in part their attention to the TendProject. Even providers' HQs were very keen on navigating compliance to tendering rules and cooperation. The projects' distinct focus and institutional arrangements triggered BusIntel actors' fear of antitrust violations because of TendProject's strict tendering procedures. The engagement in BusIntel engendered a double-edged sword. On one hand, it generated new knowledge, opening possibilities to expand business relations and integrating resources favoring value co-creation. On the other hand, it increased risks of losing entries to other ecosystems, incurring reputational damage and complicating resource management and cross-ecosystem integration of resources. Within provider organizations, this implied intense vertical communications up to strategic HQs to process the double-edged sword.

During the BusIntel project, some suppliers participated in a separate ArCo procurement process for new vehicles (referred to as the TendProject). Among bidding firms, inter-provider

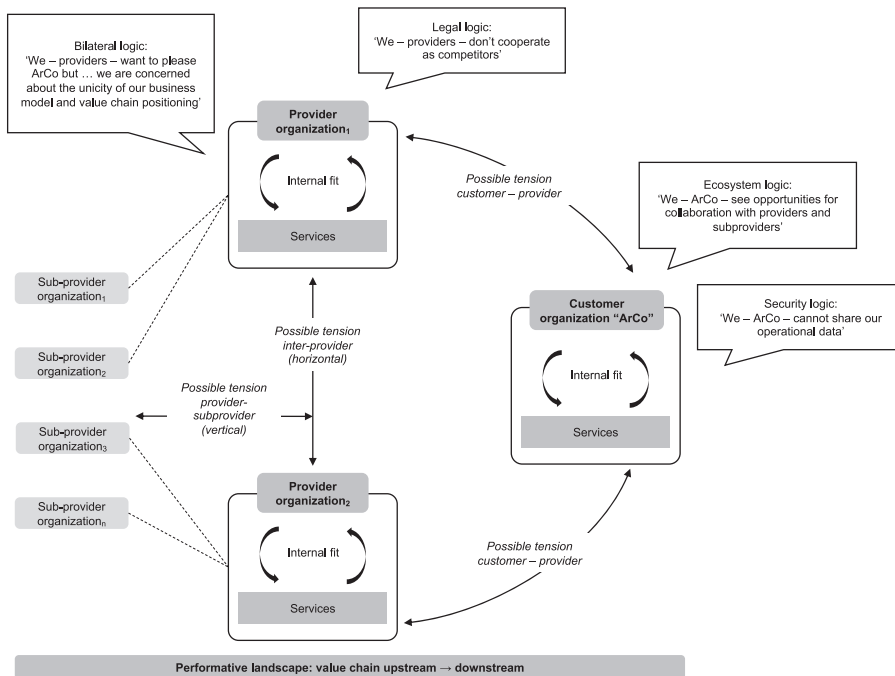


Figure 4. Tensions of developing a viable service ecosystem. Source: Authors' own work

tension was exceptionally high due to mentioned governmental antitrust interventions a few years earlier, encompassing even a government raid to obtain documents at some of the suppliers involved in the BusIntel project. The bidding firms were genuinely concerned that BusIntel might jeopardize their bid. Second, the latter tension refers to the risk of disintermediation, with a sub-supplier directly contacting a customer like ArCo to provide sub-products – such as batteries – also included in the provider's aggregated products (Jacobides and Winter, 2005). BusIntel technology would enable such direct links, with ArCo and sub-suppliers seeing' each other's stocks for the first time. Commonly known in multi-actor collaboration, achieving "configurational fit" is essential for firm performance and effective value co-creation including subordinate business models (Storbacka, 2011; Storbacka *et al.*, 2012; Storbacka and Nenonen, 2009). We witness this dynamic within actors (i.e. organizations), referring to "internal fit," as well as between actors and their environment, presented as "external fit." The former demands alignment between the core (service) business model and practices, while the latter alludes to the fit between one's own (service) business model and practices and that of others (Storbacka *et al.*, 2012).

Originally, BusIntel's ambition was to provide visibility within value chains (vertically and horizontally) and throughout the service ecosystem. This would serve ArCo well: it would provide insight into its multiple technologies in use and allow for optimizing spare stocks across its ecosystem of (sub)suppliers. A more optimal landscape for resource integration among actors would be materialized at multiple ecosystems levels. Over time, however, the project narrowed to intra-value-chain visibility, considerably limiting the scope of value co-creation and the motivation to explore a service ecosystem. The episodes can be seen as an analytical heuristic to view service ecosystem viability as an evolutionary phenomenon. Eventually, providers' competitive interests prevailed over the development of a service ecosystem.

Discussion*Contributions to service theory*

The purpose of this study was to explore service ecosystem viability. We did so through the interplay of valence and forms of becoming and empirically scrutinizing a complex and dynamic service ecosystem. Our study makes three theoretical contributions to the service realm.

First, this study contributes to service ecosystem research by showing how the positive (bright side) and negative (dark side) aspects of valence coexist. On one hand, we expand studies that seek to normalize the negative side of service ecosystem evolution by providing an empirically grounded account of its dark side. Expanding literature on the dark side of ecosystems (McColl-Kennedy *et al.*, 2020; Mele *et al.*, 2018) is vital because of the contrast between prevailing optimistic picture of service ecosystem literature (Mustak and Plé, 2020) and increasingly complex tensions at local and global scales (Howard-Grenville, 2021). Insights into valence are paramount within and between service ecosystems as they explain the inherent nature and consequences of multifaceted acts of engagement in service ecosystems (Alexander *et al.*, 2018; Viglia *et al.*, 2023). Building further on literature disclosing adverse manifestations of interorganizational collaboration (Abosag *et al.*, 2016; Chowdhury *et al.*, 2016; Oliveira and Lumineau, 2019; Tóth *et al.*, 2018), we reveal that the dark side of ecosystems consists of incongruences of logics, tensions and conflicts across multiple levels (Wieland *et al.*, 2016). Over time, these elements materialize in actor engagement, sentiments, worldviews and institutional arrangements. For example, in Episodes 3 and 4 in Table 2, exchanges that opened ecosystem possibilities also surfaced antitrust exposure and tensions with actors' own interests, while cooperation within BusIntel ran alongside competitive positioning in TendProject. Societal and sectoral forces can deteriorate the climate for resource integration, causing adverse outcomes. Inter-ecosystem engagement, increasingly common in our networked economy, can inherently cause daunting trade-offs. On the other hand, we argue that "bright" and "dark" are inseparable facets on a continuum that actors must consider when partaking in service exchange across all phases of their life cycle (e.g. Vargo *et al.*, 2015). Our findings thus add granularity to the viability of service ecosystems (Peters, 2016; Polese *et al.*, 2021; Vargo *et al.*, 2022) by exposing the finer trade-offs (e.g. external engagement, resource access and management) that actors must consider within and beyond an ecosystem.

Second, we introduce and theorize forms of becoming as an apparatus to understand service ecosystem dynamics and evolution. This matters for understanding *how* service ecosystems evolve (Akaka *et al.*, 2025; Thompson-Whiteside *et al.*, 2023; Vargo *et al.*, 2022). Drawing on organization theory literature (e.g. Chia and Holt, 2006; Nayak and Chia, 2011), we theorized and discerned two epistemologically distinct forms of becoming, namely, *building* and *dwelling*. This informs service literature that has been committed to developing a theoretical basis of service ecosystems evolution (e.g. Vargo *et al.*, 2022). Building and dwelling complement service ecosystem design literature (Vink *et al.*, 2020) by offering subtleties about how service ecosystems are designed and evolve: as a hybrid and fluid mixture of purposeful design and organic unfolding throughout actor engagement, transformation and innovation. Specifically, we were surprised by the complexity of evolving individual-collective awareness. A layered experience appeared, which combined the project's formal embracing of open innovation and transparency with an implicit dance around partially clashing interests. The wider performative landscape interacted with how intra- and interorganizational processes evolved, with the project being influenced by and influencing extra-project processes such as the active tender.

Third and finally, we coalesce valence and forms of becoming in an integrative framework (Figure 1) that provides theoretical grounding and could underpin normative guidance for understanding, designing and steering service ecosystems and their evolution. The episodes show the evolutionary processes in which bright and dark sides alternate yet co-exist across the spectrum of collectivity. Their trajectory may vary of course: some service ecosystems touch upon dark sides, but they figure out how to succeed. In the BusIntel case, this trajectory moved

from positively valenced dwelling (Episode 1) through building and its negative turn (Episodes 2–4) into negatively valenced dwelling (Episode 5), with remnants of collective engagement giving rise to new bilateral relationships in Episode 6 – see also Table 2. Unpacking resilience in service ecosystems (Blasco-Arcas *et al.*, 2022; He *et al.*, 2023) could particularly be helpful in providing multi-order and -level views of service ecosystem life cycle management in interaction with evolving engagement. The framework also offers insights into external and internal engagement and fit (Storbacka, 2011), including both bright and dark, and the management of such engagement in omnifarious environments.

Implications for service ecosystem research

Based on these contributions, our work has several specific implications for service ecosystems and related research. We concur that power plays a vital role in multiple levels of service ecosystems (Grolman *et al.*, 2025; Hogg, 2023; Lumineau and Oliveira, 2018; Mele *et al.*, 2018). It can ignite the dark side of service ecosystems when disproportionately distributed among actors. Power shapes how different configurations of coalitions within service ecosystems are formed and maintained (Hogg, 2023). Given our multilevel view of engagement, we propose that service ecosystems can be considered with different foci. Our research illustrates the internal–external dimension in investigating service ecosystems, displaying actors’ roles and relational embeddedness (Moran, 2005; Sklyar *et al.*, 2019). “Internal” refers, for instance, to dynamics between business developers involved in a project like BusIntel and their corporate legal counterparts and HQ board, the latter externally focused on key stakeholders. We argue it is vital to pay attention to both the internal-external dimension that also encompasses configurational fit (Storbacka, 2011), and the general notion of ecosystems as closed vs open systems (Alexander *et al.*, 2018; Vargo and Lusch, 2016; Viglia *et al.*, 2023). Oscillating across various levels of aggregation regarding actor engagement can help. In this sense, service researchers and managers are scrutinizing resilience and agility in maneuvering throughout service ecosystems in an increasingly digitalized and unstable world (e.g. He *et al.*, 2023). Acknowledging the interplay between service ecosystems, ancillary systems and their performative landscape becomes vital to understand the viability of transformation as a processual phenomenon.

Limitations and future research

This article contains limitations that open avenues for further research. First, this study focuses on unpacking valence and forms of becoming. We encountered but did not consider the multiple levels (cf. Sawyer, 2005; Taillard *et al.*, 2016) which evolution may occur. For future research, we suggest investigating how a complex process like transformation toward a service ecosystem evolves across levels within and between organizations (Burgelman *et al.*, 2018; Lepak *et al.*, 2007; Vargo *et al.*, 2023). It could be especially interesting to identify where positive or negative voids occur. Moreover, we noted increasing awareness among actors of their own and others’ motivations. Future research could explore processes of increasing reflexivity – e.g. socio-cognitive and affective processes (Ringberg and Reihlen, 2008).

Second, the findings provide insight into negatively valenced evolution of service ecosystems with a focus on intra- and inter-organizational levels. Although partly present, further research is needed to explicate how negative valence unfolds for individual actors and subcomponents of ecosystems, such as triads of (sub)providers (Sitaloppi and Vargo, 2017; Wynstra *et al.*, 2015). We encourage researchers to acknowledge the subjective and phenomenological nature of negative valence, and the layeredness of participants’ experiences. Explicit communications may reveal only in part these experiences; attention to tacit signals is important, given some unease about dealing with negativity. This can show how positive and negative aspects intertwine over time and across analytical levels. Moreover, we argue it is important to acknowledge subjectivity; what one actor experiences as adverse can be advantageous for the other.

Third, although perhaps transferable, our findings are not readily generalizable to other settings due to the peculiarities of our unique high-tech B2G research setting (cf. [Reypens et al., 2016](#)). We stimulate researchers to broaden research into diverse settings with different strategic needs, such as sustainability, digitalization and resilience. Our theoretical framework can guide researchers in investigating viability in other service ecosystems (e.g. platforms that routinely deliver services but may have to transform).

Finally, although negative valence suggests something to be entirely avoided, it can also serve as an opportunity. Tolerable dark side elements can ignite learning, adaptation ([Abosag et al., 2016](#)) and intervention patterns ([Ferraro et al., 2015](#)). They can function as catalysts for innovation ([Chandler, 2025](#)) and generate novel problem-solving patterns to deal with paradoxes ([Smith and Lewis, 2011](#)). For example, managers become more aware of how to navigate through situations, develop novel equilibria and anticipate negative elements. It would be worthwhile to investigate opportunities of positive-negative valence in terms of, for instance, learning and problem-solving.

Implications for practice

Managers are charged with balancing their organization's individual interests, bilateral interactions to co-create value and – increasingly – collective value co-creation, such as contributing to societal sustainability or resilience ([Bridoux and Stoelhorst, 2015](#); [Shashi et al., 2020](#)). Our study assists practitioners in doing so by understanding, maneuvering and orchestrating service ecosystem evolution and its intra- and inter-organizational dynamics, particularly when transforming bilateral relationships. Based on our findings, we offer a range of descriptive and normative guidance.

Descriptively, our two-dimensional model can be utilized to describe and monitor valence and forms of becoming. With this, service ecosystem actors are made aware of the possibilities for engagement and the potential dark side of the system, both *ex ante* and during its functioning. Furthermore, this study shows that service ecosystems can be influenced by other ecosystems and institutional arrangements (i.e. the performative landscape). In fact, this may even occur to the extent it becomes negatively valenced. Actors within one service ecosystem should be(come) aware of the development of relationships within the ecosystem and related ecosystems. We note that boundary spanners are vital in building connections within and beyond a service ecosystem ([Henderson and Palmatier, 2010](#); [Hummel et al., 2025](#)). Instead of being surprised and uncomfortable by the inevitable dark side of service ecosystems, they must be able to sense and manage both the bright and dark sides of engagement.

Normatively, based on the study's insights, we offer pathways (see [Figure 5](#)) that guide managers and business leaders in maneuvering service ecosystems. This provides management with tools to explore potential interorganizational misfits and to mitigate the influence of negatively valenced properties on engagement in service ecosystems. We would argue that exploring multiple quadrants – which we labelled according to their state – is inevitable in developing a service ecosystem, even though most practitioners would idealize succeeding in the upper two cells (positive valence). In fact, controlled exploration of the bottom two quadrants would be a key challenge to them and a driver of success. We propose “pathways to follow” (depicted in solid arrows) and “pitfalls to prevent” (depicted in dotted arrows). They assist organizations to act upon each of the four quadrants and, ideally, move from instilled antagonism and immediate crisis (bottom row, negative valence) toward a cyclical movement between conditions of continuous initiative and the desired state (top row, positive valence). In transforming from one quadrant to another, managers can resort to so-called “artificial practice breakdowns” ([Sahhar and Loohuis, 2022](#); [Sandberg and Tsoukas, 2011](#)) to change current engagement practice, experience and underlying structures.

In states of instilled antagonism, business leaders should *dissolve* current (institutionalized) structures by breaking them down and shift toward a negatively valenced building. Doing so helps managers to flesh out and make the negative aspects of dwelling explicit. Next,

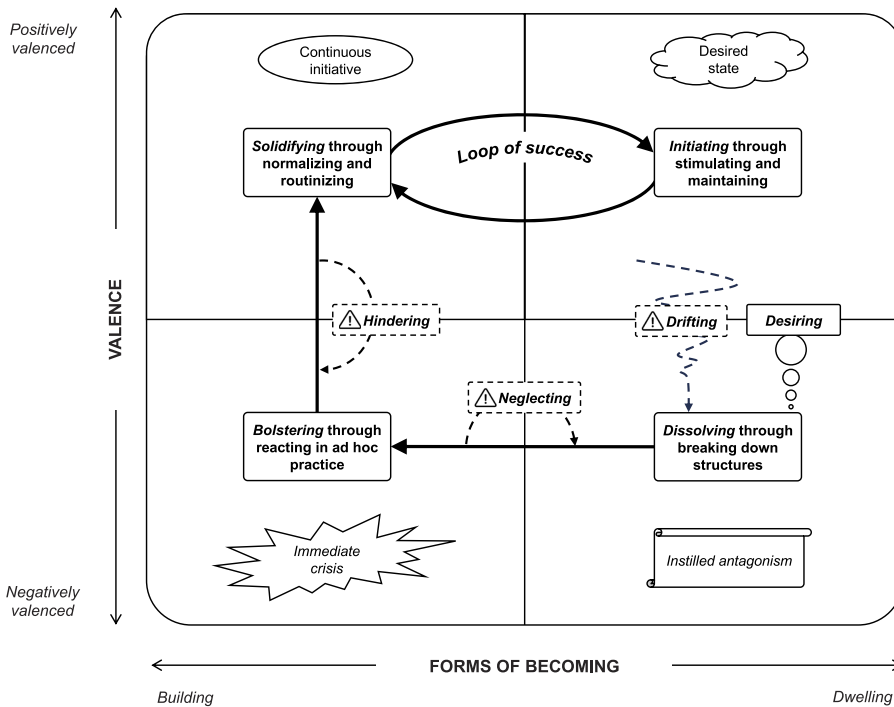


Figure 5. Maneuvering resiliently throughout service ecosystems: pathways and pitfalls. Source: Authors' own work

organizations should focus on *bolstering* by reacting in an ad hoc manner to proactively move toward a more positive state of building. When situated in states of continuous initiative, managers should attempt to *solidify* ongoing practice through normalizing and routinizing them to reach a desired state. In this realm, organizations should continuously *initiate* (positive) motion through stimulating and maintaining engagement. Ideally, organizations should aspire to move along the *loop of success*: iteratively moving between *solidifying* to facilitate positive dwelling as a modus operandi and *initiating* to prevent taken-for-grantedness (Sahhar and Loohuis, 2022). This calls for stimulating a mindset geared to innovation and taking initiative. In following these pathways, organizations should always keep track of their desire to materialize positive dwelling (e.g. ensuring a solid business model in the digital era). Simultaneously, we argue it is not attainable to directly transform instilled antagonism to the desired state: deeply engrained structures in instilled antagonism will need (regime) change. The pitfalls serve as warnings to organizations. For example, the danger of desired states is the *drifting* to idle engagement, resulting in instilled antagonism. *Neglecting* refers to not addressing destructive practices and *hindering* blocks bolstering practices. This implies that business leaders must work to understand their current positioning within and the condition of a service ecosystem, while also anticipating next steps along their pathway.

We underscore that the pathways are not linear due to the complexity of reality. Dealing with such complexity demands “wayfinding,” which refers to continuous reflexivity and a refined empirical sensitivity to ongoing changes in the landscape, as well as the constant discovery of appropriate responses (Chia, 2017; Hutchins, 1996). Beside more explicitly embedded knowledge (i.e. *episteme* and *techne*), managers must be sensitive to the role of knowledge that is intrinsically institutionalized (i.e. *phronesis* and *metis*) (Chia, 2017). This

expands organizational learning (Chia, 2017) and organizations' capacity to contribute to resilient and viable service ecosystems. The pathways and pitfalls link ecosystem viability to ecosystem orchestration literature, alerting managers to the various roles their organization can play over time (Carida et al., 2022; Kelleher et al., 2019; Nambisan and Sawhney, 2011; Perks et al., 2017).

Supplementary material

The supplementary material for this article can be found online

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