

Navigating Uncertainty in a Nascent Ecosystem: How Shifting Cognitive Frames Influence an Incumbent Firm's Platform Scope Strategies

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RESEARCH SUMMARY

We examine how an incumbent firm navigates internal and external uncertainties when entering a nascent platform ecosystem. Drawing on a longitudinal study of a large telecommunication firm's transition into an evolving IoT ecosystem, we advance a cognitive perspective on platform strategy. We explain how managers' cognitive frames shape platform scope decisions based on shifting assumptions and interpretations of ecosystem dynamics and internal capabilities. Our process model shows how deviations between expected and actual developments trigger changes in managers' attitudes toward uncertainty, thereby shifting their cognitive frames and prompting them to modify platform scope strategies, leading to oscillation between shaping and adapting strategic postures. Our theorization sheds light on the cognitive foundations of platform strategy and the dynamics of incumbent platform transitions in a nascent ecosystem.

Managerial summary

Incumbents often enter nascent digital ecosystems by introducing a platform, yet uncertainty complicates decisions about the appropriate platform scope. Our nine-year study of TELECO's IoT platform reveals three takeaways. First, scope is not a one-off decision; it evolves as managers revisit assumptions about opportunities and constraints. Second, scope decision rarely moves linearly; firms oscillate between broad and calibrated scopes, creating episodes of overreach and retrenchment. Third, interpretations of uncertainty steer these shifts: reading uncertainty as an opportunity supports shaping bets, whereas interpreting it as a constraint encourages adaptation and selective coopetition. Overall, platform decisions in uncertain ecosystems reflect organizational tensions as firms balance ambitions for dominance against market realities and the actions of ecosystem members.

INTRODUCTION

Digital technologies such as Cloud, IoT, and AI are driving the emergence of digital ecosystems and creating new opportunities for value creation and capture (Autio et al., 2018; Dattee et al., 2018; Kretschmer et al., 2020). For incumbent firms with legacy product-centric business models, exploring such opportunities often triggers a strategic transition toward a platform business model (Altman et al., 2022; Cusumano et al., 2019; Gawer & Phillips, 2013). This requires firms to simultaneously adapt their internal organizational structures and develop capabilities to establish and manage new relationships with different types of external partners (Van Dyck et al., 2024; Vuori&Tushman, 2024). A key strategic choice during this transition is determining a platform's scope—the range of complementary assets offered internally by a firm (Rietveld&Schilling, 2021). Platform scope presents the incumbent firm with a strategic dilemma. A broad scope, aligned with aggressive “get big fast” strategies, enhances prospects for rapid expansion and user lock-in, and helps to deter competition (Cusumano et al., 2019; Lee et al., 2006; Schilling, 2002), but it also demands greater resources and internal adaptation, which in turn can increase the risk of depleting organizational capacity. Conversely, a narrow platform scope is less resource-intensive and requires less internal adaptation, but can limit the firm's opportunities (Cennamo, 2021; Cennamo & Santaló, 2013; Suarez, 2005).

Resolving this strategic dilemma in a nascent ecosystem requires managers to navigate uncertainty, both external (i.e., fluid and underdeveloped ecosystem structures with underspecified roles and strategies ; Adner & Feiler, 2019; Ganco et al., 2020; Garud et al., 2022; Reiter et al., 2024) , and internal (i.e., the extent to which a firm's capabilities and assets are relevant or need to be replaced; Lavie, 2006; Vuori & Tushman, 2024). Prior research contends that, when facing uncertainties, managers rely on cognitive frames (Benner & Tripsas, 2012; Cornelissen&Werner, 2014; Gilbert, 2006) —structured sets of assumptions, beliefs, and causal expectations about how the environment works and may evolve—as a basis for decision making in nascent ecosystems (Furr & Eisenhardt, 2021; Stonig et al., 2022; Van Dyck et al., 2024) to interpret the evolving environment (Hannah&Eisenhardt, 2018; Kapoor&Wilde, 2023; Raffaelli et al., 2019) . Managers are thus compelled to harmonize frames pertaining to external uncertainties about how the ecosystem will evolve, and internal uncertainties about the capabilities required to influence the ecosystem's trajectory. The interplay between these uncertainties, which is not fully captured in existing cognitive frames research, makes the transition from a product business model to a platform business model a timely and important research context.

Dealing with these interwoven uncertainties complicates incumbents' platform scope decisions as managers juggle two contrasting attitudes toward uncertainty—viewing it as either an opportunity or a constraint (Rindova & Courtney, 2020; Uzunca et al., 2018). Viewing uncertainty as an opportunity aligns with inclinations to endogenously shape the

environment and with frames that support a broad platform scope through bold investments and proactive strategic maneuvers (Gavetti et al., 2017; Rindova & Martins, 2021). In contrast, viewing uncertainty as a constraint aligns with inclinations to adapt to exogenous changes and with frames that favor a narrow platform scope, pursued through small-scale experimentation and incremental investments (McDonald & Eisenhardt, 2020; Rindova & Courtney, 2020). Considering these cognitive trade-offs, we ask: How do cognitive frames, shaped by contrasting orientations toward uncertainty in emerging ecosystems, influence incumbent firms' platform scope strategies?

To address this question, we conducted a longitudinal, in-depth case study that reveals how decision-makers in a global network equipment provider, TELECO (pseudonym), developed and changed strategic frames that determined the company's platform scope, and consequently, its positioning strategy in the nascent IoT ecosystem. The IoT ecosystem consists of nested platforms in different technological layers (Sturgeon, 2021), which provide multiple points of entry and multiple strategic scope options for platform creators. Because TELECO was among the first firms to introduce an IoT platform, we can show how the firm changed the platform's scope by attempting to compete in multiple complementary markets and why and how managers made distinct platform scope strategy choices. Our longitudinal and processual analysis combines multiple sources of data, including observations during a multi-year field study, internal strategy documents, and formal and informal interviews covering nine years of platform strategy development in the nascent IoT

ecosystem. Observing the dynamics of platform strategies from an “inside-out” perspective (Jain, 2020) enables us to uncover the perspectives and assumptions that shape the nature of an incumbent firm’s involvement in a nascent ecosystem.

Our study advances a cognitive perspective in platform research by developing a process model that explains how cognitive frames guide platform decisions as incumbent firms navigate the tension between shaping and adapting—two conflicting strategic postures for managing uncertainty. Cognitive frames of emerging ecosystems encapsulate managers’ assumptions about the ecosystem’s future structure, competitive dynamics, and the firm’s role in the evolving platform landscape. These frames function as constructed temporary realities, integrating both the objective state of the ecosystem at a given moment and the subjective attitudes of managers toward that reality and past strategies. Our analysis identifies three distinct cognitive frames—continuity, dominance, and sub-dominance—that explain variations in a firm’s strategic posture and its impact on broadening or narrowing platform scope. We also introduce the concept of frame-shifting deviations, which occur when discrepancies emerge between existing assumptions and newly available knowledge about the ecosystem and the firm’s capabilities, which create organizational tensions as the ecosystem evolves. These deviations trigger over- and under-confidence as managers come to view internal and external uncertainties in a more favorable or more threatening light, thereby driving shifts in cognitive frames. This explains how incumbents adjust their platform scope strategies over time.

Our analysis offers three notable contributions to research on platform strategies, cognitive frames, and incumbent transitions in nascent ecosystems. First, we address calls for further research on platform scope strategies and address persistent ambiguities regarding how platform firms decide which complementary layers to provide internally in a highly uncertain environment (Cennamo, 2021; Gawer, 2021; Rietveld&Schilling, 2021) . We explain the cognitive underpinnings of platform scope strategy that reflect managers' shifting attitudes (Aranda et al., 2017) as they attempt to position platforms in nascent ecosystems. Second, we extend research on cognitive frames in uncertain environments (Garud & Rappa, 1994; Kaplan, 2008; Raffaelli et al., 2019; Tripsas & Gavetti, 2000; Weick, 1995) by identifying their distinctive dimensions, variability, and impacts in nascent ecosystems. We show how and why cognitive frames change, and conceptualize them not just as lenses for seeing into the future, but also as reflecting aspirations to influence that future by leveraging and developing a firm's capabilities. Lastly, we contribute to research on incumbent firms' platform transitions (Altman & Tripsas, 2015; Eklund&Kapoor, 2019; Van Dyck et al., 2024) by demonstrating that firms navigating nascent ecosystems face both external and internal uncertainties regarding their ambitions to shape the ecosystem while adapting to it. We extend research that considers cognitive factors beyond rational and analytical approaches in platform strategies (Vuori & Tushman, 2024; Van Dyck et al., 2024) by exploring dynamism and shifting managerial attitudes, aspects that have been neglected in prior work.

THEORETICAL BACKGROUND

Platform Scope Strategies in Nascent Ecosystems

Research suggests that developing a proprietary platform is a prime aspiration for firms entering nascent ecosystems, since doing so can potentially help them establish competitive positions as “hub” players, enabling them to capture maximum value as ecosystems mature (Altman et al., 2022; Kretschmer et al., 2020; Van Dyck et al., 2024). For an aspiring ecosystem architect, strategic decisions pertaining to scope are essential to a platform’s overall competitiveness (Cennamo & Santaló, 2013; Eisenmann et al., 2011; Gawer, 2021), as they largely determine a firm’s share of the value created in the ecosystem (Kang & Suarez, 2022), position in the ecosystem (Suarez & Kirtley, 2012), and ability to influence how the ecosystem will evolve (Daymond et al., 2023).

Platform scope strategy—that is, the range of complementary products that a sponsor offers in-house—has received comparatively less attention than platform governance, access, and pricing in the literature (Gawer, 2021; Rietveld & Schilling, 2021). Studies on platform strategy tend to focus on technological and economic aspects (Baldwin & Woodard, 2009; Eisenmann et al., 2011), suggesting that a platform strategy, particularly scope decisions, should focus on resolving systemic economic shortcomings, including value network and matching failures (Cennamo, 2021; Jacobides et al., 2024; Reiter et al., 2024). As such, extant research has focused on economic approaches to scope decisions, including transaction costs (Gawer, 2021), consumer preferences (Cennamo &

navigating a multitude of uncertainties pertaining to technologies, markets, and the evolving ecosystem structure (Hannah&Eisenhardt, 2018; Moeen, 2017; Santos&Eisenhardt, 2009) . A nascent ecosystem's fluid and ambiguous nature, with undefined competitive rules and decisions driven by subjective interpretations of vague cues rather than rational economic calculations (Dattee et al., 2018; Santos & Eisenhardt, 2009) , limits the value of purely economic views of platform scope strategy. A cognitive perspective that incorporates how managers perceive, interpret, and react to the inherent uncertainties in nascent ecosystems is necessary (Furr & Eisenhardt, 2021; Gavetti & Levinthal, 2000; Vuori & Tushman, 2024) to shed light on the behavioral foundations that inform how and why specific platform scope strategies are chosen.

Cognitive Frames and Strategies in Nascent Ecosystems

Nascent ecosystems are characterized by a high degree and pace of change (Hannah & Eisenhardt, 2018; Volberda et al., 2021) , making it difficult for decision-makers to fully assess their environment. In this context, decisions are not based purely on relatively predictable economic or technological trade-offs, since many aspects such as market opportunities and ecosystem interdependencies are unknown and difficult to estimate or predict (Kaplan & Tripsas, 2008; Kapoor & Klueter, 2021; Santos&Eisenhardt, 2009) . Consequently, managerial cognition plays a crucial role in conceptualizing and processing incomplete information and unpredictable changes (Furr & Eisenhardt, 2021; Helfat & Peteraf, 2015; Putra et al., 2024) .

2024). Research suggests that cognitive frames in a nascent ecosystem involve assumptions about the ecosystem's structure, interdependence among ecosystem actors, and how these will evolve (Adner&Feiler, 2019). For incumbent firms, entering a nascent ecosystem also involves dynamically interpreting organizational capabilities and their potential relevance to the emerging ecosystem as it quickly develops (Cozzolino et al., 2018; Khanagha et al., 2022; Stonig et al., 2022; Van Dyck et al., 2024).

Strategy research tends to portray cognitive frames as enduring and largely stable (e.g., Benner & Tripsas, 2012; Gilbert, 2006; Tripsas, 2009), with an emphasis on rigidity or inertia. However, the evolving nature of nascent ecosystems may require continuous interpretation of the environment, which can lead managers to revisit and change their cognitive frames faster than what extant theory suggests (Brown&Eisenhardt, 1997; Garud&Rappa, 1994; Putra et al., 2024). Recent research has shown that cognitive frames evolve as ecosystems unfold, whether through ventures adapting business models (McDonald & Eisenhardt, 2020), managers updating beliefs with new information (Kapoor&Wilde, 2023; Moeen et al., 2020), firms flexing frames during technological transitions (Raffaelli et al., 2019), or cognitive and emotional strains constraining adaptation (Vuori&Tushman, 2024).

In sum, managers' cognitive frames shape platform scope strategies in nascent ecosystems, where shifting conditions demand high cognitive flexibility. We analyze how these evolving frames guide incumbents' strategic choices that affect platform success or failure.

RESEARCH CONTEXT AND METHOD

Our processual research approach focuses on understanding how and why an incumbent's platform scope strategies emerge, develop, or fade away over time as the platform ecosystem evolves (Langley et al., 2013). To fully understand this process, we also examine factors that explain shifts in managers' cognitive frames that might influence strategy changes at each phase.

Research Setting

We chose TELECO and the IoT ecosystem as a strategic research setting (Bijker et al., 2012) for our exploratory study of platform creation by an incumbent firm in a nascent ecosystem. The basic idea behind IoT revolves around enabling physical devices (e.g., machinery, appliances) to communicate and exchange data with each other through the internet without direct human intervention. The digitalization of physical devices has led to a new range of products, services, and business models ranging from Google's smart thermostat (Nest) to Tesla's self-driving car. As a global provider of telecommunications equipment, TELECO was among the first firms to explore the emerging IoT ecosystem by introducing a cloud-based machine-to-machine (M2M) platform on a large scale.

TELECO's business model had been based on a traditional, product-centric supply chain whereby the firm developed and sold complex telecommunications hardware and software to mobile operators in various countries (e.g., AT&T, Vodafone, and China Telecom) (see Appendix Figure A1). TELECO's legacy ecosystem consisted mainly of mobile

operators, suppliers, and other partners, such as system integrators in the telecommunications sector. Interdependencies in the ecosystem followed a well-defined supplier-producer-consumer structure. The emergence of IoT had the potential to alter that structure and TELECO's established relationships because it triggered the convergence of previously separate industrial sectors such as software, computing, and manufacturing orchestrated by platform firms. The layered architecture of the nascent IoT platform provided multiple strategic positioning alternatives for an incumbent, so the choice of platform scope became a crucial element in determining the incumbent's future competitiveness in the ecosystem (see Appendix Figure A2). Hence, our research setting provides a rich context for studying how managers' cognitive frames emerge, change, and influence an incumbent firm's platform strategies as it competes in a nascent ecosystem.

Data Collection

We collected data using a combination of retrospective and real-time approaches (Pettigrew, 1990). Field research was conducted at TELECO's headquarters between mid-2016 and the beginning of 2020 to capture managers' subjective interpretations of events. We supplemented these observations with archival data from mid-2011 (when the firm launched its IoT platform) to February 2020.

We gathered data from four sources (see Table 1). First, the lead author engaged in *field observation* five days a week between September 2018 and February 2019 at TELECO's headquarters during the firm's standard hours of operation. Around 177 files of field notes

cognitive processes that respond to deviations between managerial assumptions and both external (ecosystem) and internal (capability) developments. However, we also show that interpretations of such deviations are organizationally embedded. Our evidence suggests that managers intentionally navigate latent tensions (Smith&Lewis, 2011) and draw on deeply entrenched organizational beliefs to construct cognitive frames that inform platform strategies.

