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Navigating uncertainty in a nascent ecosystem: How shifting cognitive frames influence an incumbent firm's platform scope strategies

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Abstract

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 move 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.

KEYWORDS

cognitive frames, incumbent firms, nascent ecosystems, platform strategies, strategy process

1 | 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 9 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 (Van Dyck et al., 2024; Vuori & Tushman, 2024) by exploring dynamism and shifting managerial attitudes, aspects that have been neglected in prior work.

2 | THEORETICAL BACKGROUND

2.1 | 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, 2023), 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 & Santaló, 2013), demand heterogeneity (Adner et al., 2016), positions of existing platforms in the ecosystem (Suarez & Kirtley, 2012), technological bottlenecks (Baldwin & Woodard, 2009), and the competitive actions of complementors (Zhu & Liu, 2018).

Digital platforms have an unbounded scope for growth due to scalable resource bundles, which simultaneously drive hyperspecialization and hyperscaling (Giustiziero et al., 2023). Moreover, the complexity of a platform scope strategy increases when an ecosystem comprises competing sets of nested platforms operating in different technological layers (Sturgeon, 2021; Yoo et al., 2010). In such layered ecosystems, platform creators encounter multiple options for entry and scope, including which (and how many) technical layers the platform will have and which market segments it will target (Dattee et al., 2018; Sturgeon, 2021). For instance, a platform creator may choose a narrow scope by operating at a foundational layer (e.g., chipsets, networks), or by focusing on a higher, user-facing layer (e.g., operating systems, applications) to address specific market segments (Adner et al., 2016; Cennamo & Santaló, 2013; Suarez & Kirtley, 2012). Alternatively, the firm may choose a broad scope by targeting many layers simultaneously in a bid to achieve lock-in advantages (Eisenmann et al., 2011; Sturgeon, 2021). Platform creators, therefore, need to assess which competitive dimensions to emphasize and which capabilities to invest in to determine the optimal platform scope.

Nascent ecosystems introduce novel challenges for incumbent firm managers when making strategic platform scope decisions. In such contexts, managers are confronted with 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.

2.2 | 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).

Managers' cognitive frames entail assumptions about the environment and required organizational actions (Walsh, 1995), providing knowledge structures that guide interpretation and decision making (Cornelissen & Werner, 2014). Frames can stem from prior experiences such as industry affiliation, analogies, or identity (Tripsas & Gavetti, 2000), or from forward-looking visions (Gavetti et al., 2017; Snihur et al., 2022). They influence firms' strategies in new markets, including entry decisions (Ozalp et al., 2022), capability development (Gavetti & Rivkin, 2005), and product design (Anthony et al., 2016). While earlier work often emphasized adaptive responses to change (Gilbert, 2006), recent studies distinguish between adapting and shaping approaches to uncertainty: adapting emphasizes incremental learning to respond to evolving conditions (Rindova & Courtney, 2020), whereas shaping involves bold commitments to reconfigure markets and ecosystems (Furr & Eisenhardt, 2021). Overall, this research highlights how cognitive frames influence whether managers treat uncertainty as a constraint to adjust to or an opportunity to exploit (Rindova & Martins, 2021).

In an emerging platform ecosystem, managers' cognitive frames entail much more than interpreting new technologies and associated possibilities or consequences (Kaplan & Tripsas, 2008), because managers must develop and change assumptions pertaining to two interlinked, yet separate evolutionary processes: dynamics associated with the emergence of a nascent platform ecosystem (Khanagha et al., 2022), and dynamics of internal adjustment toward a platform-based business model (Stonig et al., 2022; Vuori & Tushman, 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.

3 | 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.

3.1 | 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 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 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.

3.2 | 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* 5 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 were gathered from observations of internal meetings and presentations about IoT initiatives. Second, we conducted 37 *semi-structured interviews* with senior and middle-level managers involved in these initiatives during the observation period. The interviews lasted from 30 to 70 min and were recorded and transcribed (except for three cases). We also held five workshops with managers at TELECO to gather additional input and refine our emergent findings. Third, we collected and analyzed TELECO's *internal archival materials*, including presentations, product and marketing guidelines, internal video recordings, and project planning documents related to the IoT platform. We analyzed 335 documents and 44 videos covering TELECO's IoT initiatives from 2011 to 2020. Fourth, we collected and analyzed *publicly available archival materials*, including analyst reports, press articles, and commentaries relating to IoT initiatives implemented by

TABLE 1 Data sources.

Data sources	Details	Use in the analysis
Semi-structured interviews and workshops	37 semi-structured interviews with 35 senior and middle-level managers involved in TELECO's IoT platform initiatives	Gaining insights on managers' interpretations of ecosystem dynamics, opinions about TELECO's IoT strategy, and the rationale behind the emergence of a strategy
	5 focus group workshops between 2018 and 2019	Presenting the preliminary findings for triangulation purposes and verifying the validity of our interpretations
Field observations	18 months of observations at the firm's headquarters, 5 days a week during standard work hours	Providing an in-depth understanding of the internal strategy development process within TELECO and the organizational context
	117 files of field notes from observations of internal meetings and presentations	Identifying tensions and strategic dilemmas faced by managers when implementing strategy
Internal archives	335 files of internal documents including presentations, product and marketing guidelines, annual reports, and project plans	Providing a detailed description of the IoT platform strategy, including the platform's technical design, and the partnership/ecosystem strategy, and how these evolved over time
	44 video recordings of senior managers' internal presentations and discussions about IoT strategy ranging from 4 to 90 min	Gaining an understanding of the underlying motivation behind particular strategies and related strategic assumptions held by the managers
	54 instances of managers' comments in an internal online strategy forum and internal social media platform about IoT	Capturing the issues and concerns of managers from different organizational units involved in TELECO's IoT strategy
Published reports, articles, and commentaries	51 analyst reports on the consequences of IoT for the telecom industry and specific reports on TELECO's IoT strategy, accessed via Google search and TELECO's internal database	Acquiring an additional understanding of the context and securing an outsider's view of the evolution of TELECO's strategy in IoT; triangulating observations and facts
	77 files of articles and commentaries published on industry news websites such as telecoms.com, iotrevolution.com, and online blogs	

TELECO and other firms (i.e., mobile operators, telecommunications equipment providers, and big ICT firms). With extensive access to TELECO's premises and internal archives, we were able to obtain primary data that provided detailed information on TELECO's IoT platform strategies. This enabled us to study the managerial beliefs and assumptions underlying the development of and changes in managers' cognitive frames and the firm's platform scope strategies. Secondary and external data on the IoT ecosystem helped us triangulate our observations and provide a verifiable and nuanced account of the dynamics under study.

3.3 | Data analysis

Given the complexity of our data, we adopted an iterative approach, shifting back and forth between the data and the emerging process model (Corbin & Strauss, 2008). To make sense of data from multiple sources, we performed content analysis by following a four-step process.

First, we searched TELECO's internal archive to extract any documents related to IoT initiatives between April 2011 and February 2020. We created a list of events and constructed a case history of TELECO's platform scope strategy. We also consulted published articles to capture the evolution of the ecosystem and its competitive dynamics. We developed a timeline of events and applied temporal bracketing (Langley, 1999) to categorize different phases of development, which corresponded to changes in the platform's scope and ecosystem dynamics (see Figure A3). Then, we identified TELECO's three platform scope strategies by examining internal documents that described the platform's technical specifications, target markets, and ecosystem/partnership strategies.

Second, we focused our analysis on understanding the cognitive frames underlying the platform scope strategies. We analyzed the interview transcripts, field notes, and internal documents, using open coding to identify and cluster relevant concepts into categories (Gioia et al., 2012). We performed content analysis by identifying specific expressions that reflected managerial beliefs, assumptions, or expectations, such as "We believe," "We think," or "We will be … in the future." By engaging in this exercise, we identified first-order concepts and grouped them into second-order themes based on conceptual similarity. The second-order themes captured the assumptions underlying managers' frames across the three phases, including assumptions about the ecosystem's structure, growth opportunities, and the relevance of the firm's capabilities. We clustered the emergent second-order themes into aggregate dimensions, or theoretical constructs representing managers' cognitive frames in each phase.

Third, we focused our analysis on uncovering drivers of the shifts we observed in the cognitive frames. The interview transcripts, field notes, and video presentations revealed deviations between managers' assumptions and unfolding realities, and the consequences thereof. Employing the same coding technique as in the previous step, we structured and analyzed the data. We identified frame-shifting deviations that prompted managers to evaluate their assumptions and eventually change their cognitive frames.

Lastly, we validated the emerging theoretical constructs and related them to each other systematically (see Figure A3) (Gioia et al., 2012). We consulted the literature and conducted follow-up meetings with key informants to infer the relationship between managers' cognitive frames and the firm's platform scope strategies and associated dynamics. In addition, in several workshops and group discussions, we presented our exploratory findings to managers involved in TELECO's IoT initiatives to ensure the validity of our interpretations and theoretical model.

4 | FINDINGS

Our longitudinal analysis enables us to unpack the unfolding platform scope strategies of an incumbent with a product-centric business model, as it attempted to enter a nascent platform ecosystem. Our research allows us to identify managers' frames that informed TELECO's platform scope strategies as well as the drivers of shifts in the frames that led to changes in the scope. In this section, we describe the three themes that emerged from our data analysis: (a) dynamics of platform scope strategies, (b) changes in frames that influence platform strategies, and (c) drivers explaining shifts in cognitive frames.

4.1 | Theme 1: Dynamics of platform scope strategies

Our first theme introduces three distinct platform scope strategies adopted by TELECO during the first 9 years of the firm's involvement in the nascent IoT ecosystem. These strategies differ in terms of the firm's functionalities (i.e., technical layers covered by the platform) and positioning within the ecosystem. Figure 1 illustrates TELECO's platform architecture and Table 2 presents an overview of the three platform scopes.

4.1.1 | Narrow platform scope (2011–2015)

As early as 2010, even before the term "Internet of Things" became widely used, researchers at TELECO saw an opportunity to build a cloud-based digital platform that would incorporate disparate systems into a single large network of connected "things," which later became known as the IoT ecosystem. IoT-related efforts at this stage were mostly bottom-up initiatives steered by a division attuned to the existing business model (i.e., product-based). By the end of 2011, TELECO launched its IoT initiative, a device connectivity platform (DCP). As shown in Figure 1, the scope and positioning of TELECO's IoT platform were narrow, focused on a specialized layer, in line with the company's technological expertise and targeted toward users and complementors from its legacy ecosystem. Specifically, TELECO focused on the connectivity management layer aligned with its technological capabilities in wireless connectivity. Moreover, TELECO dedicated its connectivity platform to the mobile operator market to "leverage established networks of customers and partners" (Internal document, 2012). Within 3 years, TELECO was able to successfully acquire subscriptions from 20 major mobile operators with around 8 million connected devices. Overall, TELECO's platform scope in this phase focused on a specific functionality in one specific layer of the nascent IoT ecosystem (i.e., connectivity), consistent with the firm's existing technical capabilities and its legacy ecosystem (see Table 2).

4.1.2 | Broad platform scope (2015–2018)

Toward the end of 2015, IoT became one of TELECO's "targeted growth areas" (Annual report, 2016). In mid-2016, TELECO launched the next generation of its IoT platform, which offered functionalities in all technological layers, thereby significantly broadening the firm's positioning and potential market. TELECO positioned the platform as "the center of the IoT ecosystem and

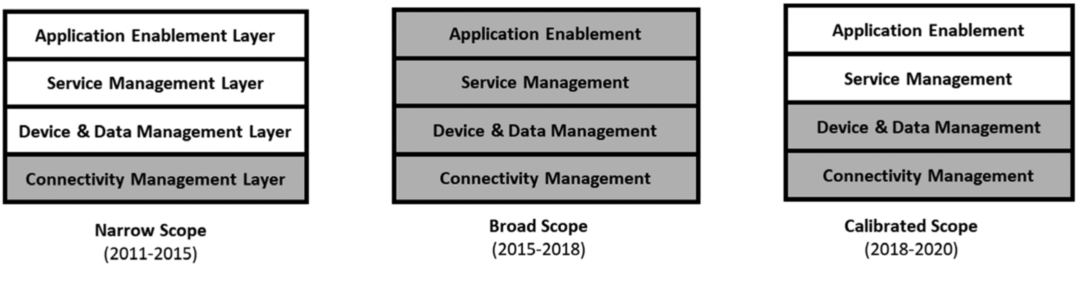

FIGURE 1 TELECO's platform scope (2011–2020).

TABLE 2 TELECO's platform scope (2011–2020).

Platform scope	Technology feature(s)	Target market(s)	Illustrative quotes
Narrow scope (2011–2015)	Development of a specific technical layer (i.e., connectivity layer) in line with the firm's legacy technical capabilities	Targeting existing customers (i.e., mobile operators) and leveraging partners from the legacy ecosystem	• TELECO is a leading network equipment provider with a lot of connectivity know-how and experience. The combination would therefore facilitate the global extension of machine-to-machine (M2M) applications. (Internal document, 2012) • The DCP is a platform offered to [mobile] operators for B2B wholesale business development of M2M. (Internal document, 2011) • Our wanted position: TELECO connectivity platform perceived as the leading machine-to-machine connectivity management platform by 2020. (Internal document, 2014)
Broad scope (2015–2018)	Development of multiple technical layers (i.e., full-stack platform) extending beyond the firm's technical capabilities	Expanding the target market (i.e., cities, manufacturing, automotive) and ecosystem of complementors (i.e., application providers)	• Our focus is to expand the platform further with extended connectivity management & aggregation, network near functionality, and differentiating technology supporting our prioritized verticals. (Internal document, 2017) • We are targeting vertical markets such as the utility market, automotive, intelligent transport systems, maritime, and public safety markets. We will explore and expand with selected solutions across industries. (Internal document, 2017) • IoT-A platform sits at the heart of our end-to-end (E2E) IoT offerings and is

TABLE 2 (Continued)

Platform scope	Technology feature(s)	Target market(s)	Illustrative quotes
			the hub for innovation, ecosystem collaboration, and partnerships. We onboard devices and apps onto our platform and are a natural link between mobile operators and industries. (Internal document, 2018)
Calibrated scope (2018–2020)	Development of selective technical layers (i.e., connectivity layer and device management layer) that better correspond to the firm's current technical capabilities	Refocusing on a selected target market and aligning with powerful actors (i.e., large ICT firms)	• The core of TELECO's IoT-A is connectivity and device management—two closely related core functions of any IoT system. These are complex components that have a large impact on functionality, security, and ease of deployment, where, as experts on networks and connectivity, we can provide the greatest value to enterprises than anyone else in the IoT ecosystem. (Internal document, 2019) • TELECO IoT platform takes a non-competitive position with the other players, like device makers, cloud providers, and systems integrators in the IoT field. Our solutions are complementary to their offerings. (Head of IoT, 2018) • Mobile operators will still be important in IoT. We need to educate the operators on how to sell IoT to enterprises. We also need to make enterprises aware of the capabilities that IoT can bring, the capabilities that mobile operators & TELECO can bring through IoT. (Platform manager, 2019)

the hub for innovation, linking mobile operators, industry [e.g., product manufacturers, automakers], device manufacturers, and application developers" (Internal document, 2016). In contrast to the prior strategy, this strategy aimed at developing a platform that spanned all possible technological layers, expanding target markets, and selling services directly to industrial customers in various sectors (see Figure 1 and Table 2). Moreover, the IoT unit created a sub-unit called "Ecosystem & Use Case," which was responsible for creating a broader ecosystem of complementors with new partners from outside the telecommunications industry (e.g., utilities, automakers, city councils) and fostering the development of IoT use cases in multiple industrial contexts (Internal document, 2016). In addition, TELECO created an "IoT Marketplace," a digital portal that facilitated interaction between mobile operators, app developers, device makers, and end users. TELECO was also actively involved in influencing the broader IoT ecosystem through industry consortia and thought leadership. The firm published several white papers and organized various outreach events focused on convincing other stakeholders that the next-generation cellular network technology (5G) would be the foundation of the IoT ecosystem and that TELECO was "in a strong position to drive the IoT revolution" (Internal document, 2017).

4.1.3 | Calibrated scope (2018–2020)

In mid-2018, TELECO calibrated its platform scope and market positioning by discontinuing its involvement in the service management and application enablement layers and refocusing on the connectivity and device data management layers (see Figure 1). The firm aimed to solidify its position in the connectivity layer by leveraging its solid reputation in cellular IoT (IDC, 2018) and extending it by adding adjacent features. In addition, TELECO repositioned the platform as a "global connectivity and device management platform" which could enable mobile operators "to move higher up the IoT value chain" (Internal document, 2019). TELECO thus abandoned its previous strategy of selling IoT solutions to industry customers, focusing instead on mobile operators as its main go-to-market channel. TELECO also created a program called Enterprise Lead Generation, which helped generate demand through a matchmaking process that linked mobile operators to industrial customers. These approaches aimed to strengthen mobile operators' role in the ecosystem and enable them to seize opportunities in areas other than connectivity, ultimately increasing the value of the TELECO platform.

Moreover, TELECO adopted a non-competitive approach with the large cloud computing and application providers. Having abandoned the strategy to create its own application ecosystem, TELECO partnered with other platform providers such as Microsoft and Amazon, which had large and established application ecosystems. TELECO managers called this approach an "ecosystem-of-ecosystems" strategy, as it involved calibrating the platform scope by refocusing the platform's features on select technical layers that better matched the firm's current technical capabilities. The firm also refocused on select customers as its target market and sought to collaborate with powerful actors in the ecosystem (see Figure A5). Analysts interpreted TELECO's strong focus on mobile operators as a clear positioning message and rated TELECO's IoT platform as "the most mobile-operator-friendly" platform (OVUM, 2019).

Throughout our study period, TELECO adopted three distinct platform scope strategies that focused on different technical layers and target markets. Further analysis revealed that changes in the platform's scope were influenced by managers' cognitive frames prevalent in different phases. Next, we describe managers' assumptions and frames underlying the firm's platform scope strategies.

4.2 | Theme 2: Dynamic frames for an emerging platform ecosystem

Our analysis revealed that changes in TELECO's platform strategies were influenced by managerial assumptions about how the ecosystem would develop, the size of growth opportunities, and how these fit with the firm's organizational capabilities. Over time, these assumptions formed three distinct cognitive frames (continuity, dominance, and sub-dominance) which represented managers' evolving beliefs about the ecosystem's structure and how the firm could position itself within it. Below, we detail the different managerial assumptions behind each cognitive frame and show how these assumptions influenced the firm's platform scope strategies (see Table 3).

4.2.1 | Continuity frame (2011–2015)

TELECO's narrow platform strategy was driven by managers' beliefs about the continuity of the firm's legacy ecosystem in the nascent IoT ecosystem. In the early phase, they lacked a clear reference for how the IoT ecosystem would evolve, prompting them to make assumptions about the ecosystem's structure, growth opportunities, and fit with the firm's capabilities.

Assumption about the ecosystem's structure: Continuity of the legacy ecosystem

In this phase, TELECO's managers believed that the firm's venture into IoT was a "natural progression" from its legacy business in the telecommunications equipment ecosystem (Internal document, 2011). Thus, they assumed that the structure of the IoT ecosystem (i.e., actors' roles, respective positions, and interdependencies) would be similar to that of the legacy ecosystem. Managers also expected that interdependencies among actors would follow a similar linear value chain, where the firm would supply the technology (i.e., platform) to mobile operators, who in turn would sell connectivity services for IoT devices to their customers, with no other major players in the ecosystem (see Figure 2). The managers envisioned mobile operators, that is, TELECO's main customers, playing a prominent role in the IoT ecosystem, not only as connectivity providers, but also as "prime integrators" of IoT offerings (Internal document, 2012). Mobile operators were considered to have important assets and capabilities relevant to the emerging IoT ecosystem (e.g., access to end users and "ownership" of these accounts, network infrastructure), even though they had not proactively pursued the opportunity and appeared to lack a clear vision for IoT:

> Mobile operators, as the owners of the connectivity, are in a strong position to profit from the new [IoT] ecosystem. They have key assets in the form of a large customer base and have extensive experience in building and running networks.
>
> (Internal document, 2012)

Assumption about growth opportunities: Incremental to the existing market

Managers expected the increase in connected devices to provide moderate growth opportunities for TELECO because they assumed the new demand would mainly come from their existing customers (i.e., mobile operators). The growth opportunity was therefore considered to be an extension of their current mission of "connecting places and people" to "connecting things," all of this via the operators which sold to end users and enterprises (Internal document, 2011).

TABLE 3 TELECO managers' cognitive frames (2011–2020).

Frames for emerging ecosystem	Assumptions about: Ecosystem structure	Growth opportunities	Capability fitness	Illustrative evidence
Continuity (2011–2015)	The structure of the IoT ecosystem (i.e., actors and their interdependencies) will be similar to the existing telecommunication ecosystem	Incremental growth opportunities based on the emerging needs of existing core customers	The capabilities required will be consistent with the firm's legacy capabilities	• *From being the owner of the service and customer relation, operators will be a part of the end solution, and the customer relationship is many times moved to a specialized service provider bundling the connectivity with a device and application, and selling this to the end user*. (Senior manager, 2013) • New revenue opportunities are emerging for mobile operators through the delivery of M2M and consumer device connectivity services, which add value for enterprises and consumers. (Internal document, 2011) • We manage over 950 million mobile subscribers, and we have the competence to build the best in class platform. (Internal document, 2011) • *First and foremost, IoT is the key for the existing core business of the TELECO. Connectivity is prerequisite for IoT, you need to connect all different devices and IoT will drive a*

TABLE 3 (Continued)

Frames for emerging ecosystem	Assumptions about: Ecosystem structure	Growth opportunities	Capability fitness	Illustrative evidence
				lot of connectivity. (Senior manager, 2015)
Dominance (2015–2018)	The structure of the IoT ecosystem is malleable and will be radically different from the telecommunication ecosystem	Transformative growth opportunities across multiple types of customers (both existing and new customers)	Head-start capabilities to shape the ecosystem.	• *In fact, the IoT market is so large and still very nascent … more value will be created higher up the value chain. … The industry is moving up the stack very quickly with platforms becoming the next battlefield.* (Video presentation, 2016) • TELECO's mobility report forecasts more-than-tripling of the number of IoT connected devices globally from under 5 billion today to 16 billion in the next 5 years. Meanwhile, McKinsey concludes that IoT has a potential global economic impact of up to USD 11 trillion by 2025. (Internal document, 2017) • *We have the combination of expertise, services, software, and connectivity infrastructure capabilities to transform IoT. We have the breadth of capabilities that are required to ensure that nothing is left*

TABLE 3 (Continued)

Frames for emerging ecosystem	Assumptions about Ecosystem structure	Growth opportunities	Capability fitness	Illustrative evidence
				unaddressed. (Head of digital services, 2016) • *We are a leading software provider and developer across all areas of the network, including OSS and BSS—these capabilities we see as being key to what will be needed to flexibly support the plethora of future (IoT) use cases, some of which we can only imagine right now*. (CEO, 2015)
Sub-dominance (2018–2020)	An increasingly complex ecosystem will be dominated by large, resource-rich ICT firms	High growth opportunities with a narrower group of customers (mostly existing customers and limited new customers)	Existing capabilities are only sufficient to explore certain opportunities in the ecosystem	• *The main challenge and risk of the previous strategy were getting into competition with the cloud platform players such as IBM Watson, Microsoft Azure, AWS*. (Senior manager, 2018) • *The market for IoT cellular connectivity is around 50B SEK. So, the market is actually big enough for us. If we can get 10%–15% of the total market, that is already quite big*. (Portfolio manager, 2018) • *We need to focus our resources and bet on the areas where we have a chance to win and reach a global leading scale. Connectivity and*

TABLE 3 (Continued)

Frames for emerging ecosystem	Assumptions about: Ecosystem structure	Growth opportunities	Capability fitness	Illustrative evidence
				device management are the areas that we will focus on. (Head of IoT, 2019) • *Previously we tried to address some industries that were way out of our scope like agriculture, healthcare. IoT is very explorative and very new area. I think we put so much pressure … to make money … in industries that weren't ready for that*. (Partnership manager, 2018)

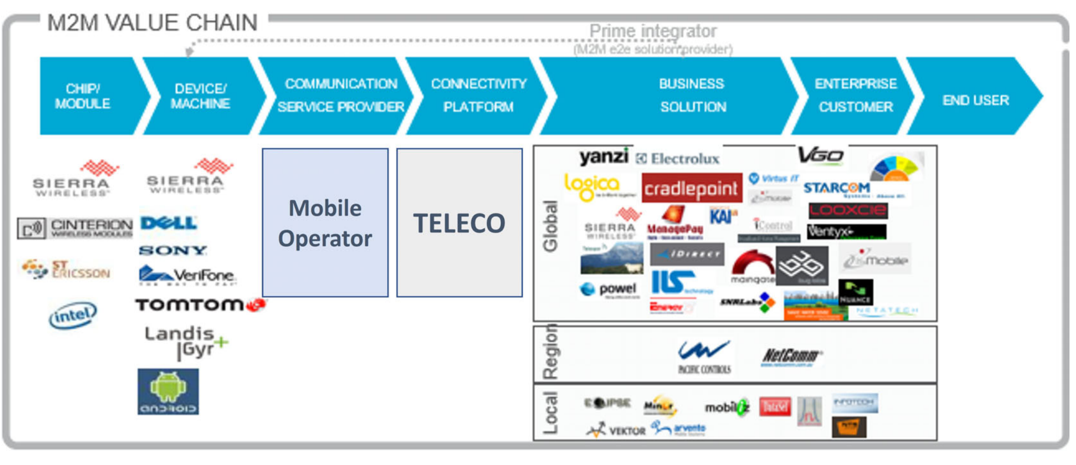

FIGURE 2 Assumptions of a linear IoT ecosystem structure (*Source*: Internal document, 2013).

TELECO managers assumed that these growth opportunities would stem from the potential increase in data consumption and related connectivity services:

> We are in the early stages of the next major inflection point for our industry—the connection of a vast array of "things." The cost of connecting devices is falling and the value of connectivity is rising for individuals, businesses, and society in general.

> ... New revenue opportunities are emerging for mobile operators through the delivery of M2M [machine-to-machine] and related connectivity services.
>
> (Internal document, 2010)

Assumption about necessary capabilities: High fit with the firm's core capabilities
Managers assessed the opportunities offered by the IoT ecosystem through the prism of the firm's knowledge and experience in its existing ecosystem. For instance, they tended to believe that the capabilities required in the IoT ecosystem would be consistent with the firm's core capabilities in network and cellular technologies. Moreover, attracting complementors or developing applications were not seen as urgent priorities because managers expected actors in the current ecosystem to play similar roles in the new ecosystem, at least initially, such that external developers would not play a major role. This was because connectivity was assumed to be the "key enabling technology" for IoT, as noted by the CEO:

> We have been the leader for more than 130 years ... TELECO has for over a hundred years been connecting places with fixed telephony services. From the 90s onwards, we connected people. Today, we are expanding into the ICT arena ... It is a natural progression. We're now reaching the inflection point where now we are connecting things.
>
> (CEO notes, 2012)

Overall, the assumption about continuity and a high level of conformity with the firm's legacy ecosystem influenced the firm's strategic decisions regarding platform scope. The continuity frame encouraged TELECO to focus on platform features that were in line with its technological legacy and focus on customers that the firm knew very well (see Table 3).

4.2.2 | Dominance frame (2015–2018)

Starting in 2015, important changes in assumptions about the ecosystem's structure, growth opportunities, and the relevance of TELECO's capabilities in the new ecosystem led managers to radically expand the platform's scope.

Assumption about the ecosystem's structure: Departure from the legacy ecosystem
In this second phase, managers began to believe that the IoT ecosystem structure was radically different from the legacy ecosystem (see Figure 3). They believed that firms outside the telecommunications industry, including large ICT platform firms such as Microsoft and Amazon, would enter and become part of the IoT ecosystem. Nevertheless, since the context was still new and emerging, TELECO managers concluded that the ecosystem structure was malleable: no dominant players existed and clear interdependencies between actors had not yet been established. In contrast to the earlier phase, managers now believed that TELECO had the opportunity to shape the ecosystem to its advantage and thus become a central player in it. For instance, the head of IoT believed that big ICT players such as Amazon and Microsoft "lacked connectivity expertise" and that their IoT platforms were "sub-scale" compared to TELECO's platform (Internal video, 2016). Managers had inflated confidence in what TELECO could achieve as a central player in the ecosystem that would bridge various members, as stated by the head of IoT:

> Connectivity and network infrastructure remain an essential element for the development of the IoT. We can unlock the potential for different players in the value chain to deliver value by enabling mobile operators to expose network connectivity IoT APIs and monetize these assets. [Hence,] we are enabling the IoT transformation by bridging mobile operators with enterprises in their IoT deployments.
>
> (Head of IoT, 2015)

Assumption about growth opportunities: Transformational growth

At this stage, managers believed that IoT had the potential to create transformational growth for TELECO. It could enable the company to strategically diversify "from a single industry portfolio to a multiple industry portfolio" (Senior manager, 2016). In contrast to the previous phase, managers enthusiastically believed that TELECO's role should expand beyond that of a mere connectivity provider with an exclusive focus on the mobile operator market. The expectation among managers during this phase was that by developing a full-stack platform, TELECO could expand beyond mobile operators because it had all the technical capabilities required to develop IoT use cases in different industries. In an employee meeting, the head of IoT articulated her vision of TELECO "climbing up the value chain" by controlling a "full-stack" platform that offered functionalities beyond connectivity:

> There's no real growth in providing only connectivity. Connectivity is the key, but connectivity is not enough. We need to move up the value chain and deliver more than just connectivity. Building pre-integrated solutions is essential to tap into the higher value of the stack.
>
> (Head of IoT, 2016)

Assumption about capabilities: A head start in shaping the ecosystem

The right capabilities and technological pipeline (e.g., 5G) to shape it according to their vision. In contrast to the earlier phase, they were now excessively confident that TELECO had "the breadth of capabilities that are required to ensure that nothing is left unaddressed" (Internal document, 2015). They expected that the impending emergence of 5G, the next-generation

FIGURE 3 Assumptions of a radically different ecosystem structure with TELECO as a central player (*Source*: Internal Document, 2016).

cellular technology, would accelerate the adoption of IoT and increase the diversity of IoT applications. As TELECO was a key developer of 5G technology, managers believed that the IoT ecosystem would evolve in ways that would strengthen TELECO's position in it:

> IoT is already happening even without the official arrival of 5G. The diversity of the IoT use cases will be further enhanced by 5G. With our global industry leadership in 3GPP [cellular technology] and now 5G, we are enabling the IoT transformation for both mobile operators and vertical industries.
>
> (Internal document, 2017)

Overall, the assumptions underlying the dominance frame stood in sharp contrast with those of the continuity frame. Under the dominance frame of this second phase, managers came to assume that the IoT ecosystem would be radically different than the firm's legacy ecosystem and that it represented a tremendous growth opportunity that could allow TELECO to become a dominant player in the new ecosystem (see Table 3). Such assumptions encouraged TELECO to expand its platform scope to shape the ecosystem to its advantage.

4.2.3 | Sub-dominance frame (2018–2020)

In this phase, the course of events led managers to once again change their assumptions about the ecosystem's structure, growth opportunities, and the firm's capabilities.

Assumption about the ecosystem's structure: Increasingly complex and competitive

As the ecosystem developed and became more mature, TELECO's managers recognized that its structure had become much more complex and competitive than what they had previously envisaged. They realized that major ICT players with extensive capital resources, led by Amazon Web Services (AWS) and Microsoft, held much stronger positions than they thought, and were moving very rapidly to position themselves as central actors in the IoT ecosystem, especially at the platform and data analytics layers. These firms leveraged their cloud capabilities to offer integrated IoT platforms that combined device management, data processing, edge computing, and AI services. Aware of this new and evolving reality, TELECO managers became increasingly convinced that large ICT companies' extensive resource commitments to this space would be very hard to match. In contrast to the earlier phase, managers began to believe that competing for domination in the ecosystem would be an uphill battle, demanding not only financial resources, but also managerial attention, and that they were at a disadvantage against major ICT companies.

> We used to develop our own [developer] ecosystem. However, we can't compete with IBM-Watson, Microsoft Azure, AWS, and all these big cloud platforms. They have announced serious investments in IoT platform. Now, we need to reach out to their ecosystem rather than building our ecosystem because that is a way to get leverage.
>
> (Ecosystem manager, 2018)

Assumption about growth opportunities: Significant growth in specific layers

In contrast to their beliefs in Phase 2, TELECO managers now believed that the company could still achieve significant growth by leveraging expertise in connectivity and knowledge of mobile operators' needs. In this sense, the growth assumptions in this new adaptive frame were close to those in the proactive frame, except that managers had revised their assumptions about growth opportunities from “connectivity is not enough” to “connectivity is big enough.” TELECO's partial success in influencing the ecosystem, evidenced by the wide adoption of cellular technology for IoT connectivity, as well as their previous broad engagement with multiple industrial partners, had given company managers valuable information that enabled them to identify more targeted growth areas. In this phase, TELECO managers believed that the more immediate growth opportunities provided by IoT would be in meeting the emerging needs of mobile operators and a few industrial sectors in lower layers of the stack (i.e., automotive and manufacturing companies; Internal document, 2018).

> It's meaningless to say that connectivity is not big enough. Overall, it's much bigger than many of the markets that TELECO is addressing. Of course, connectivity is smaller than applications and analytics, which is addressed by well-established firms for each specific sector, but the market is big enough for us to have a meaningful business.
>
> (Portfolio manager, 2018)

Assumptions about capabilities: Sufficient capabilities to explore specific opportunities

With a clearer understanding of how the ecosystem was unfolding, managers realized that the firm's capabilities were only sufficient for exploring opportunities in certain layers of the ecosystem. They believed that building and orchestrating a large application ecosystem and obtaining domain knowledge to develop IoT use cases in many industries were simply not possible in the short term, given TELECO's current capabilities. Compared to the previous phase, they believed that TELECO had not developed sufficient credibility beyond the telecom market, which made it even harder to compete in application markets:

> We were developing a whole layer in the stack because we thought that was what our customer needs. But where our reputation is, and where our core is, is on the lower layer [connectivity]. It was also hard for us to target both mobile operators and end users and make end-to-end use cases that serve every geography and every need.
>
> (Head of IoT, 2018)

Through our analysis of the three phases above, we have shown how the different frames for an emergent ecosystem and underlying managerial assumptions influenced TELECO's strategic decisions regarding the platform's scope. In the next theme, we present a detailed analysis of why the cognitive frames shifted and the deviations and tensions that triggered those changes.

4.3 | Theme 3: Frame-shifting deviations

Our third theme focuses on the drivers of shifts in the cognitive frames that led to changes in platform scope strategies. We found that when managers' assumptions deviated from internal (i.e., firm-level) and external (i.e., ecosystem-level) developments in different phases of the ecosystem's evolution, managers dealt with uncertainties by prioritizing one of the two competing sets of assumptions (see Table 4). Such *frame-shifting deviations* were triggered by managers' reassessments of their assumptions about (a) TELECO's role in the ecosystem vis-à-vis other ecosystem players (i.e., ecosystem deviations), and (b) TELECO's capabilities vis-à-vis the company's actual performance (i.e., capability deviations) and by (c) organizational tensions that these reassessments brought about.

4.3.1 | Positive frame-shifting deviations: The faltering of continuity frame and the rise of dominance frame

Internal and external developments in this phase inflated managers' expectations about growth opportunities, which made them overconfident in their ability to shape the ecosystem and become a dominant player.

4.3.2 | Ecosystem deviations

The technological and market developments of the IoT ecosystem from 2011 to 2013 were slow, as evidenced by the low number of IoT-related patents and scant news coverage during this period (see Figures A6 and A7). At that time, the most active and salient players in the ecosystem were mobile operators and startup firms. However, by 2015, IoT was attracting significant news coverage and had become a hot new industry trend. By the end of 2015, the number of connected machines and devices had reached close to 15 billion globally (having doubled since 2011), leading to increased adoption of the IoT in various sectors (IDC, 2016). Moreover, starting in 2015, large ICT and cloud computing firms such as Google, Microsoft, IBM, and Amazon began entering the emerging IoT ecosystem by introducing their own IoT platforms (Table A1 lists entry dates for these firms). Many large non-ICT firms such as GE, Siemens, and ABB also began to explore how IoT applications could be leveraged in their sectors. Such developments represented a deviation from TELECO managers' initial assumptions about the similarity between IoT and the telecommunications ecosystem that had led them to expect a moderate growth opportunity.

> The IoT market is so large and still emerging. Analysts couldn't agree on how large it is, since definitions can vary quite widely. Our strategic analysis shows global IoT spending estimates range anywhere from 300 to 2900 billion USD. Having said that, the industry is moving up the stack very quickly with platforms becoming the next battlefield.
>
> (Internal document, 2015)

At the same time, and despite increased overall enthusiasm about the IoT space, mobile operators in 2015 maintained their passive stance toward the IoT ecosystem; they were slow to progress and did not "take an active part in developing solutions beyond connectivity" (Internal document, 2014). This perceived inertia in operators' actions also deviated from TELECO managers' initial assumptions about the central role that they expected mobile operators to have in the IoT ecosystem. The entry of multiple new actors together was interpreted as lending credence to the argument that the IoT business opportunity was large and real, fueling overconfidence among TELECO managers. This, paired with the mobile operators' lack of assertiveness, convinced managers that TELECO should and could assume a broader, dominant role.

TABLE 4 Drivers of changes of the cognitive frames.

Drivers of changes in frames	Deviations	Illustrative evidence
Positive deviations *(Continuity to dominance frame)*	*Ecosystem deviations* New actors outside the legacy ecosystem (both startups and large firms) enter the nascent ecosystem Existing customers adopt a passive stance toward the nascent ecosystem and do not play a central role, as expected	• The adoption of connected devices reached 15 billion in 2015. Major players such as IBM, Microsoft, and Amazon have launched IoT Platforms. (Internal document, 2015) • IoT is a completely new type of business for mobile operators and most of them do not have a clear strategy. (Engagement manager, 2016) • Engagement with end-users from non-telco industries such as utilities, public safety, and transportation to explore IoT. (Internal document, 2016) • TELECO arguing that they are in a better position than (mobile) operators to deliver global capability and orchestrate partner relationships, by leading the charge. (Heavy reading, 2016)
	Capability deviations Success in building a critical installed base in a short period Success in collaborating with new ecosystem players to develop new value propositions lead to over-confidence	• Platform subscriptions from 20 mobile operators globally with 8 million connected devices managed. (Internal document, 2014) • *The partnership with the Bridge Alliance (a consortium of mobile operators) to deploy the TELECO device connectivity platform is a critical milestone to make the adoption of cellular services in IoT economically viable*. (Senior manager, 2015) • Successful collaboration in developing new IoT applications with non-telco partners such as Maersk, Volvo, and Landis + Gyr. (Internal document, 2015) • *One of the things that very important is our go-to-market partners. [For example,] the agriculture use case actually showcases of our strategy execution where our partners who happen to build an agricultural solution utilized our assets. They used our connectivity and our device management [platform], and now even analytics monetization to build an application.* (Senior sales manager, 2017)

TABLE 4 (Continued)

Drivers of changes in frames	Deviations	Illustrative evidence
	Organizational tensions Strong organizational pressure to expand beyond core businesses	• Looking forward TELCO will stand for transformation of any industry—from operators and media companies to industry leaders and to disruptive innovators—all wanting to capture the full benefits of ICT in the Networked Society (Internal document, 2014). • Digitization and IoT is happening now [...]. For us, this means that we need to act now to not miss out on the opportunity (Internal document, 2014) • *TELECO is on a transformation journey. Today, 66 percent of our business comes from software and services; just years ago the majority was hardware. [...]. Now, with industries and even whole societies being disrupted by mobility, broadband and cloud, we need to accelerate our own transformation*. (CEO, 2016)
Negative deviations *(Dominance to sub-dominance frame)*	*Ecosystem deviations* Large ecosystem actors increase their dominance in some technological layers Existing customers increase their ambitions and involvement in the nascent ecosystem, leading to potential tensions	• Large ICT firms increasingly gained market share at a rapid pace. (IDC, 2018) • *IBM, Microsoft, AWS, Google and PTC have announced serious investments to promote their IoT platform offerings ... We need to engage with them and find ways to work with them because they're so big in IT, that's a necessity*. (Head of ecosystem, 2019) • *Mobile operators are and will remain central players in the IoT ecosystem. They want to increase their relevance and open new value-creation opportunities. They will therefore remain important customers and partners to us.* (Head of IoT, 2019) • *We will not sell directly to enterprises. It is never a good idea to compete with our own customers. We will leverage our strong mobile operators' relationships.* (CEO, 2018)
	Capability deviations Outcomes of the platform scope strategy fall short of expectations	• *To build use cases, you need to have the domain knowledge. I don't think we can build the use cases by ourselves, because simply we don't know [how]. I mean we are not necessarily known for ... having*

TABLE 4 (Continued)

Drivers of changes in frames	Deviations	Illustrative evidence
	Exposure of capability gaps that cannot be filled easily by the firm lead to under-confidence	*the domain competences [as an application provider]*. (Senior manager, 2018) • *We are a product company, not necessarily as a physical product. Then, we want to have IoT as-a-service. [But] we are not turning into a service company like Accenture and IBM. We can't do that*. (IoT technology manager, 2018) • *It was also for us to target both mobile operators and end users and make end-to-end use cases that serve every geography and every need*. (Head of IoT, 2018). • *I think we were primarily organized in the fashion that it's better to deal with a few major partners rather than with a lot of smaller firms. Ecosystem building is probably one of the capability gaps that we have*. (Ecosystem manager, 2018).
	Organizational tensions Corporate mandate to regain profitability and discipline	• *We need to make sure that we invest the increased* (R&D) *spending wisely in competitive products and solutions, relevant to our customers* (mobile operators) (CEO, 2017) • *Profitable growth creates a stronger company but also increases the value of the company* [...]*unprofitable growth is value destructive. Therefore, we need to look at disciplined, profitable growth*. (Head of IoT, 2018) • *We are prioritizing profitability over growth and continue to work on cost and efficiencies across the organization. We are scrutinizing all areas of our performance and let's be clear, we will fix this*. (CEO, 2018)

4.3.3 | Capability deviations

By the end of 2014, TELECO's DCP platform was being used by 20 major mobile operators worldwide and was managing approximately 8 million connected devices (Internal document, 2014). The firm's progress and performance were considered remarkable, given the early stage of the IoT ecosystem (M2M Now, 2013), far exceeding managers' initial expectations. These developments were interpreted as positive signals supporting an increase in IoT investments. Moreover, TELECO's engagements with end-users and partners outside the telecommunications industry (i.e., utilities, automakers, and city councils) to develop IoT applications had resulted in successful proofs of concept (Internal document, 2015). Such successes, combined with their expertise in 5G technology and global footprint, led to managers' over-confidence in TELECO's capabilities, fostering the belief that the firm had the critical capabilities to be a central player in the ecosystem:

> We've been doing it for many years, long before the term IoT became super-hot in the last 18 months. We've led the market with our IoT connectivity platform, and it has become an industry-leading product in that space … We have created an efficient go-to-market organization based on 10 regions. Backed by our collective global knowledge, our regional competence and close customer relationships provide a solid foundation for profitable growth in this space.
>
> (Marketing director, 2016)

4.3.4 | Organizational tensions

Around 2015, strategic conversations at TELECO started to reflect dissatisfaction with a perceived lack of ambition for leadership in emergent digital areas. The CEO warned: *"We have been the leader for 137 years, and the only thing I know is that will not help for the next 137."* (Internal document, 2014). Similarly, a group of middle managers challenged the dominant focus on sustaining position in core business. In an influential internal memo titled *"Old Is Not Enough"* (Internal document, 2015), they argued that to sustain its proud history of leadership TELECO needed to embrace digital transformation; they aligned their framing with the CEO's vision of "*Networked Society*" (Internal document, 2014), which encouraged diversification into sectors where connectivity technology would matter. These calls for exploring emergent opportunities contrasted with views to prioritize product innovation for core customers and were not shared across TELECO, but nonetheless contributed to the interpretative process leading to shaping posture and broader scope strategy.

Overall, the rapid adoption of IoT, the entry of actors from outside the telecommunications industry, and the firm's success in building a critical installed base and collaborating with end users deviated from managers' initial assumptions. These positive deviations, coupled with the framing of digital technologies as opportunities for sustaining historical leadership, triggered overconfidence that helped overcome latent tensions and amplify managers' ambitions to become a dominant player in the ecosystem. As a result, the continuity frame was replaced by a dominance frame, which led to changes in TELECO's platform scope strategies.

4.3.5 | Negative frame-shifting deviations: The faltering of the dominance frame and the rise of the sub-dominance frame

Our analysis reveals that the dominance frame started to falter in 2018 due to deviations between managers' assumptions and internal and external developments that unfolded in the later stage of the ecosystem's evolution (see Table 4). These negative frame-shifting deviations exposed managers to tensions between the legacy ecosystem and the new ecosystem, shaking managers' confidence and prompting them to adjust their assumptions.

4.3.6 | Ecosystem deviations

In contrast with the early second phase (2016–2017), IoT technologies had begun to mature and diffuse in 2018, as evidenced by the increased number of IoT-related patents during this period (see Figure A7). As this second phase unfolded, the IoT ecosystem became "a hotbed of competitive activity" among IoT platform providers (IDC, 2018), as large ICT firms were increasingly gaining market share at a rapid pace. Microsoft, for instance, expanded its IoT activities in the service and application layers by making an additional $5 billion investment (IDC, 2018). By 2018, Amazon, Microsoft, and Google together had become major players in the IoT application and service management layers, with nearly 80% market share (see Figure A8). Aggressive growth of these competing platforms challenged managers' assumptions, undermining their confidence in TELECO's ability to decisively shape the IoT ecosystem. The growing market reach and influence of large, resource-rich players made the risks of direct competition, and the advantages of collaboration (i.e., coopetition), evident. This harsh new reality altered the previous assumptions held by TELECO managers about the malleability of the ecosystem:

> We thought that we can build our own [IoT] application and ecosystem, and compete with the likes of AWS, IBM. Now I don't think we can build the ecosystem and application by ourselves, because simply we don't know. Let's say we have an application or use case. Who would come to us? I mean we are not necessarily known for a player having the domain competences [as an application provider].
>
> (Senior manager, 2018)

In addition, many mobile operators in 2018 had finally started to include IoT as part of their strategic agendas and thus sought to play more prominent roles as IoT solution providers for enterprise customers (GSMA, 2018). Mobile operators had begun to ramp up their investments to proactively engage in IoT activities, instead of being content with merely providing connectivity. This new approach was clearly in conflict with TELECO's own ambitions to play a central role in the full IoT stack, as doing so would inevitably create tensions between TELECO and actors in its legacy ecosystem, threatening the firm's core businesses:

> We can't go to mobile operators and say, "We give you [IoT] business. Take it or leave it," because then they will say, "If you are competing with us in IoT, then we will buy fewer radio base stations from you."
>
> (Senior manager, 2018)

Eventually, increased domination of large ICT ecosystem actors and the involvement of mobile operators in IoT challenged TELECO's initial assumptions about the viability of pursuing opportunities beyond the telecommunications market. They also deflated managers' confidence in the firm's ability to shape the ecosystem and its ambitions to become a dominant player in the ecosystem, even in areas where they had enjoyed early successes.

4.3.7 | Capability deviations

In addition to an increasingly competitive landscape, the outcomes of TELECO's expansive strategy had, by mid-2018, fallen significantly short of managers' predictions. They had come to realize that building a vast IoT application ecosystem for all industries was simply "one of the capability gaps that TELECO couldn't fill" (Ecosystem manager, 2018). Managers increasingly doubted the firm's ability to compete with increasingly dominant platforms such as AWS and Microsoft. TELECO had invested large sums of money to create a dedicated business unit and recruit industry experts based on the conviction that the firm would be able to resolve any capability gap. Yet, they discovered that building the necessary expertise was more complicated and much more expensive than they had anticipated. Indeed, failures undermined managers' confidence in the firm's capacity to provide the required capability in the application layer:

> We have invested time, effort, and resources into a range of platform functions and selected use, but have struggled to get our offerings to scale in an economically sustainable way. This has led to multiple small and scattered successes, but no big breakthroughs that will grow fast enough to become a major business for TELECO.
> (Head of emerging business, 2018)

4.3.8 | Organizational tensions

TELECO's investments and incursions into multiple areas weakened its cash position (Internal document, 2018), which fueled growing skepticism toward ambitious pursuits of new digital opportunities far from the firm's core. In 2018, the new CEO bluntly articulated the tensions between proponents advocating dominance in the emerging ecosystem and those supporting a more responsive and adaptive approach: *"We have to accept some mistakes [...] we cannot afford to be arrogant – a criticism I've heard from customers. Instead, we must be humble and listen to our customers."* (CEO internal communication, 2018). The new CEO issued a corporate mandate to be "selective and disciplined" in exploring emerging businesses (CEO, 2018). As a result, there was a misalignment between the IoT unit, which followed an expansive platform strategy, and the firm's new profitability-first corporate strategy. These emerging tensions, constraints and investment guardrails collectively tempered confidence in transformational IoT growth and shifted interpretations toward more selective opportunities.

The growing dominance of larger ecosystem actors, potential conflicts and contestations with actors from the legacy ecosystem, and discrepancies between expectations and actual performance began to challenge managers' assumptions. The tensions between the new strategic mandate for achieving growth with disciplined adaptation to core customers and the ambitious shaping of markets pursued by the company in IoT, further compounded the negative deviations, undermining the confidence in the firm's ability to become a dominant player in the ecosystem. Hence, pressures to adapt once again to ecosystem changes prevailed over managers' ambitions to shape the nascent ecosystem. The dominance frame faltered and was replaced by a sub-dominance frame, resulting in a calibration of TELECO's platform scope.

4.4 | Process model of frames for platform strategies in a nascent ecosystem

Based on our findings, we propose a model (see Figure 4) of why and how cognitive frames change and guide the platform scope strategies of an incumbent firm as it transitions from a traditional business model to a platform model. In our setting, these shifts manifest as temporary states of over- or under-confidence that reorient frames toward shaping or adapting, respectively.

4.4.1 | Navigating interrelated uncertainties and shifting managerial attitudes

Our model highlights how the partial endogeneity of the change trajectory—linked to the success of platform strategies—influences contrasting managerial attitudes toward uncertainty. A set of dynamics leads managers to perceive uncertainty as an opportunity, prompting proactive attempts to shape the environment; the other orientation frames uncertainty as a constraint, prompting internal adaptation. As uncertainty in nascent ecosystems persists, managers shift between these contrasting attitudes and adopt different approaches to competing mandates and opportunities.

Our model predicts that as managers encounter major deviations—defined as events that diverge significantly from prior managerial expectations regarding ecosystem developments and internal capabilities—they assess the ecosystem's future in different lights. Crucially, these shifts do not necessarily reflect a more accurate or realistic appraisal of capabilities, since unexpected outcomes often intensify biases rather than reduce them (Fasolo et al., 2024), leading

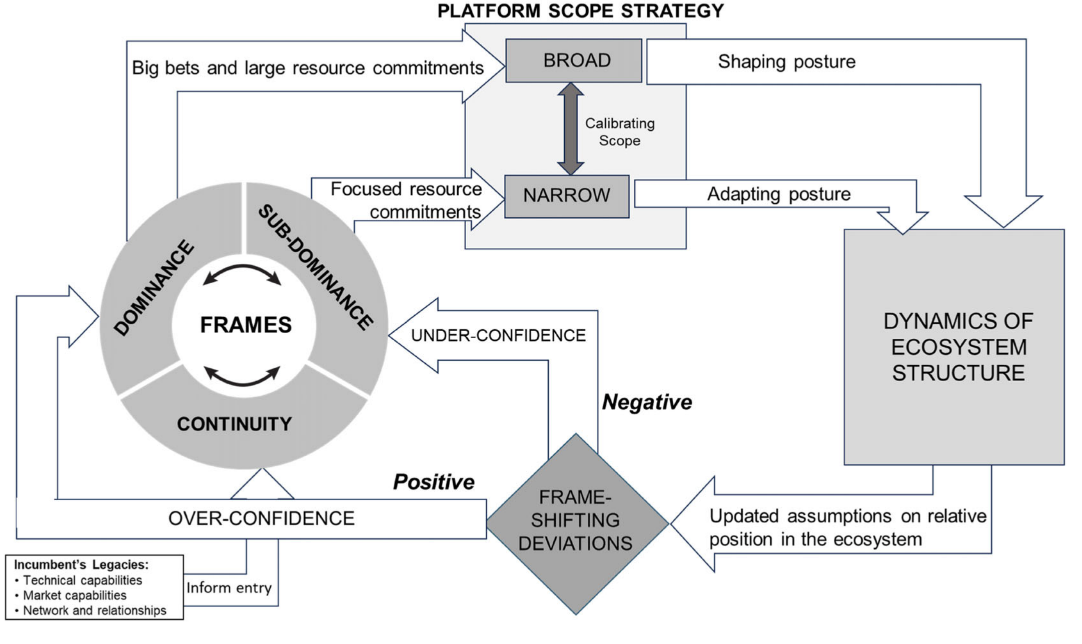

FIGURE 4 Model of frame dynamics for platform strategies in a nascent ecosystem.

managers to disproportionately overestimate or discount their firm's strengths and weaknesses. These deviations in outcomes prompt managers to move between states of over-confidence and under-confidence, corresponding to whether they orient themselves toward shaping or adapting, respectively.

4.4.2 | Shifting cognitive frames in an emerging ecosystem

In line with prior research, our model underscores that managers' strategies in the face of uncertainty are driven by their cognitive frames. However, rather than conceptualizing cognitive frames as interpretations of exogenous factors, we argue that incumbent managers' cognitive frames integrate assumptions about both exogenous changes and the role their platform firm's capabilities play in this emergent landscape.

Early on, managers tend to anchor their thinking in a continuity frame, assuming that established industry structures will persist and that their role is primarily one of incremental adaptation. Under uncertainty, managers rely on familiar environments and previous experiences (Gavetti et al., 2005; Kahneman et al., 1982) as the basis for strategic assumptions and directions (Eggers & Kaplan, 2009; Helfat & Peteraf, 2015). However, as the ecosystem evolves, managers develop competing cognitive frames that shape their decision-making.

The dominance frame rests on the assumption that the ecosystem will differ from the legacy industry, thus with the firm's established capabilities playing a pivotal role in shaping its trajectory. Managers who adopt this frame see the ecosystem as a landscape where the firm's unique capabilities can manifest in multiple ways across various technological layers, allowing the firm to lead and shape. This perspective anticipates transformative growth opportunities and assumes that the firm will continue to play a crucial role in defining industry structures across customer segments.

By contrast, the sub-dominance frame is grounded in the belief that the ecosystem will be shaped by multiple, powerful actors rather than the incumbent firm. Managers who adopt this frame assume that the firm's capabilities will remain relevant, but that the firm will not play a central role, prompting them to focus on selective engagement and strategic alignment with dominant ecosystem actors. The firm's role is primarily to enable others to innovate by offering core functionalities aligned with the firm's capabilities. Growth opportunities exist, but are limited to fulfilling the emerging demands of dominant ecosystem actors. Here, the assumption is not about omnipresence, but about optimized relevance that recognizes areas in which the firm can add distinct value (Grégoire et al., 2010). Thus, our model suggests that the salience of the dominance versus sub-dominance cognitive frames is not driven by rational interpretations of available information; rather, it reflects managers' shifting attitudes toward uncertainty.

4.4.3 | The cognitive underpinnings of dynamic platform scope strategy

Our model shows that platform scope strategies do not solely reflect rational cost–benefit analysis, but are shaped by shifting managerial beliefs and assumptions about the emerging ecosystem and the firm's role within it. These shifts reflect boundedly rational 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.

5 | DISCUSSION AND CONTRIBUTIONS

In our longitudinal study, we have addressed the question of how cognitive frames influence incumbent firms' platform scope strategies by unpacking ecosystem dynamics that lead to shifts in frames and temporarily constructed realities that inform platform strategies. Our main contribution lies in advancing a cognitive perspective on platform scope strategies, offering theoretical insights into cognitive frames in ecosystems and incumbent platform transitions in the face of interwoven uncertainties.

5.1 | Advancing a cognitive perspective of platform strategies

Although scope is a critical dimension of platform strategies, drivers and implications of managers' decisions about scope remain ambiguous, and the underlying motivations for adopting particular platform strategies are not fully understood (Rietveld & Schilling, 2021). We have addressed calls for research in this area by focusing on how managerial cognition shapes scope strategies in nascent platform ecosystems, moving beyond analytical and rational cost-value trade-offs (Hagiu, 2014; Huber et al., 2017; Seamans & Zhu, 2017) or the realized dominance and size of a platform (Rietveld et al., 2020). Specifically, we have shown that scope strategies shift in response to changes in cognitive frames of dominance and sub-dominance reflecting how managers envision their firm's emerging position and influence, which in turn guide the adoption of broad versus narrow scope. This perspective highlights the role of temporarily constructed realities as key drivers of scope strategy beyond a firm's current platform position.

Beyond the choice of scope, our theorization has broader implications for platform strategy research. While prior work has examined how end users and complementors respond to uncertainties (Subramanian et al., 2011; Toh & Agarwal, 2023), less attention has been given to the cognitive processes of managers who develop platform strategies. Our research suggests that under uncertainty, platform strategies are primarily shaped by managerial cognition, which does not necessarily follow a rational cost–benefit analysis. Instead, these strategies are influenced by shifting attitudes of managers that can drive platform firms toward either shaping aggressively or more cautious, adaptive approaches. A firm's subsequent strategic posture determines a platform's intended position within the nascent ecosystem and whether it pursues a winner-takes-all, get-big-fast approach or a symbiotic, niche-focused strategy.

5.2 | Reconceptualizing cognitive frames in nascent ecosystems

Our research advances scholars' understanding of cognitive frames in important ways. First, we not only highlight how shaping and adapting postures reflect managers' assumptions and beliefs about a platform ecosystem and its evolution, but we also address calls for deeper inquiry into how and why these postures shift over time (Rindova & Courtney, 2020). Rather than considering organizations to assume a continuous or consistent strategic posture, we have shown that organizations oscillate between these postures as managerial attitudes under uncertainty change. Prior research emphasizes that cognitive frames are shaped by political, social, or organizational dynamics, including contestation across groups and institutional interests (Ellis et al., 2025; Kaplan, 2008), and that they guide strategic interpretation and search under complexity (Gavetti et al., 2005; Gavetti & Levinthal, 2000). We have extended this view by showing how changes in confidence—triggered by the juxtaposition of the realities of a rapidly evolving ecosystem against managers' prior assumptions—reshape managers' attitudes toward uncertainty. This enables us to advance discussions on the dynamic nature of cognitive frames (Raffaelli et al., 2019), which often attribute frame shifts to external pressures (Raffaelli et al., 2019), resolutions of framing contests (Cornelissen & Werner, 2014; Kaplan, 2008), and capability-driven adjustments based on past strategic decisions and rational assessments of competencies (Eggers & Kaplan, 2013). Instead, we highlight that subjectively inflected interpretations of uncertainty can explain frame dynamics. These do not simply result from analytical performance-driven assessments or upgraded assumptions based on new knowledge, but are shaped by behavioral elements such as managers' over- or under-confidence in their firm's capacity to address an ecosystem's changing needs (Hodgkinson & Healey, 2011).

Whereas scholars typically consider frames to be cognitive representations that help managers interpret and make sense of exogenous uncertainties (Tripsas & Gavetti, 2000; Weick, 1995), we have shown that they also incorporate endogenous thinking, as managers perceive opportunities to actively steer ecosystem development to their advantage. This insight advances research on the cognitive aspects of ecosystem strategies by emphasizing the interactionist nature of assumptions and beliefs about the future. Our perspective on shaping and adaptation highlights that cognitive frames are not merely responses to external uncertainty, but also instruments through which managers attempt to influence how the ecosystem unfolds.

5.3 | Incumbents' platform transitions

Our study contributes to research on incumbents' platform transitions by demonstrating that incumbent firms navigating nascent ecosystems face not only external uncertainty, but also internal uncertainty about their own organizational transformations. Unlike prior research, in which scholars have assumed that incumbents' decisions are shaped primarily by external uncertainty and rational capability assessments (Danneels, 2011; Van Dyck et al., 2024), our findings reveal that internal uncertainty—specifically, how managers interpret their firm's role and capabilities in the evolving ecosystem—plays an equally central role in strategic choices. Rather than viewing a platform transition as a rational response to advance organizational goals (Ansari et al., 2016; Snihur et al., 2018), we contend that managerial attitudes toward uncertainty influence their assessments of firm capabilities, affecting whether they emphasize shaping or adaptation strategies.

Our work resonates with recent research that identifies platform transitions as subjective processes (Vuori & Tushman, 2024) while moving beyond analyzing cognitive reactions to past events. We have conceptualized shifting attitudes—both positive and negative—as primary influences on how managers envision the future and navigate uncertainty. Our work also builds on recent findings that platform transitions are driven by assumptions and beliefs about an ecosystem's future (Khanagha et al., 2018; Van Dyck et al., 2024) by exploring changes in these assumptions and beliefs. By viewing over- and under-confidence and the resulting organizational tensions as triggers influencing shifts in firms' strategic postures in uncertain environments, we have provided a forward-looking perspective on the formulation and evolution of incumbents' platform strategies. Specifically, we have illustrated how cognitive frames can be both inhibiting—leading to risk-averse behaviors that discourage aggressive "get big fast" strategies—and catalytic—fostering bold initiatives aimed at shaping the ecosystem and achieving dominance across complementary platform layers.

5.4 | Managerial implications

Our findings have important implications for managers. The success of platform firms in the economy and the lure of network effects and "winner takes most" outcomes are powerful incentives that can fuel the expectations of many "wannabe" firms in emerging platform spaces. In practice, creating a platform is not extremely difficult, but selecting the right platform scope and finding a defensible positioning within an emergent ecosystem is. Managers considering a platform play should keep in mind that platform emergence is fraught with uncertainty, and that when making strategic decisions, it is crucial to integrate new information and adapt to maintain a strategic advantage. This inherently requires quick and decisive actions rather than passive responses. Managers should gather information, prepare backup plans, and act decisively in critical moments to revise their strategies effectively. For firms strategizing in a nascent ecosystem, it is essential to not only adapt to new environments, but also identify opportunities to actively shape them. As platform landscapes are more complex and diverse than most traditional industries, firms must build scenarios that consider the entry of different players from adjacent (and even distant) markets and simulate how the entry of such players would change their strategic decisions. Lastly, it is important to remember that integrating the perspectives of internal organizational dynamics with external market conditions as a platform evolves is the key to defining its proper scope and positioning within emerging ecosystems.

5.5 | Boundary conditions, limitations, and future research

Our process model likely is bounded by our research setting: an established firm with a strong record in a general-purpose technology (Gambardella & McGahan, 2010). The model may be primarily applicable to nascent ecosystems with layered, modular architectures (Springer et al., 2025; Yoo et al., 2010), in which competition between platforms occurs across different technological layers. Within these boundary conditions, our process model likely applies to many different contexts. Indeed, other case studies seem to validate our model. For example, GE first expanded its digital platform broadly but later narrowed its focus to a few specific industrial uses (Cusumano et al., 2019). However, the sequence of cognitive frames and scope strategies may not be uniform across contexts. Sponsors often progress from continuity to sub-dominance and eventually to dominance. When market traction is achieved quickly, early success can induce overconfidence and an expansive shaping posture leading sponsors to adopt the dominance frame directly and maintain it rather than reverting to sub-dominance. Sponsors may also invoke the dominance frame when confronting de alio entrants with established platform models (Reischauer et al., 2025), positioning themselves as credible challengers to shape ecosystem expectations. We conducted our research in a business-to-business environment where dependencies on powerful complementors are strong and influence a sponsor's strategies. In future research, scholars may explore platform strategies in contexts that provide more latitude to shape the environment without creating tensions with legacy partners and complementors.

By focusing on platform scope strategy, we have responded to calls to further explore this topic and, more generally, the fundamental strategic issue of scope. In future research, it may be fruitful to study other platform strategies (e.g., governance) to investigate whether the shifts we identified in managers' cognitive frames and platform strategies are generalizable. Our findings constitute a first step in explicating the dynamics whereby cognitive frames influence a firm's response to rapid changes in the environment. In future empirical work, researchers could explore the cognitive abilities of incumbents' top management teams which enable them to adopt different cognitive frames over time (Helfat & Peteraf, 2015; Putra et al., 2024). Lastly, while our case focuses on an incumbent firm's efforts to advance a proprietary platform, incumbents may also establish open platforms, where the potential for any single sponsor to achieve dominance or sub-dominance is more limited. In these settings, firms often rely on more subtle mechanisms to pursue their strategic objectives while shaping the broader ecosystem to reflect their unique capabilities and sources of competitive advantage. These dynamics highlight the need for further research into how incumbents navigate and strategically leverage platform openness.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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