



Platform ecosystems as meta-organizations: Implications for platform strategies

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Abstract

Research summary: Platform ecosystems have spurred new products and services, sparked innovation, and improved economic efficiency in various industries and technology sectors. A distinctive feature of the platform architecture is its modular and interdependent system of core and complementary components bound together by design rules and an overarching value proposition. Accordingly, we conceptualize platforms as meta-organizations, or “organizations of organizations” that are less formal and less hierarchical structures than firms, and yet more closely coupled than traditional markets. To function successfully, however, platforms require coordination among multiple participants not all of whose interests are aligned. These organizational features of platforms raise many interesting and complex strategic challenges and hold implications for how platforms compete. In this paper, we discuss some of the most salient features of platform ecosystems as meta-organizations, specifically in terms of the sources of authority or power in the ecosystem, the motivation and incentives a platform creates to attract participants, and its governance and coordination structures. We then consider how papers appearing in this special issue inform us about the effects of these features on platform competition along three distinct dimensions:

(a) with traditional incumbents as platforms enter and establish themselves in new markets, (b) with other platforms to secure an advantageous market position, and (c) with the different participants on the platform to share the value that has been created jointly. We close by identifying some promising directions for future research.

Managerial summary: Platform ecosystems have spurred new products and services, sparked innovation, and improved economic efficiency in various industries and technology sectors. A distinctive feature of the platform architecture is its modular and interdependent system of core and complementary components bound together by design rules and an overarching value proposition. This makes platform ecosystems an organizational form on its own (a “meta-organization”), neither possessing the hierarchical instruments of a firm, nor the largely uncoordinated decisionmaking of markets. Successful platform ecosystems require coordination among multiple participants with possibly conflicting interests. We discuss some of the most salient features of platform ecosystems as meta-organizations, specifically in terms of the sources of authority or power in the ecosystem, the motivation and incentives a platform creates to attract participants, and its governance and coordination structures. These features affect how platform ecosystems compete: i) with a traditional incumbent, ii) with other platform ecosystems, and iii) between different participants of the same platform ecosystem. The articles published in this special issue speak to different aspects of platform competition from the perspective of organization design.

KEYWORDS

complementor strategies, ecosystems, multisided markets, platform governance, platforms

1 | INTRODUCTION

Platform-based ecosystems are a vital source of dynamism and innovation for many technologies, products, and services in the global economy. By leveraging modularity and specialization, platforms have spurred innovation and increased efficiency in diverse sectors such as

computers, videogames, mobile phones, automobiles, payment systems, e-commerce, government, and more. We reflect on the strategic management literature and, particularly, the contributions of the articles appearing in this special issue to better understand the competitive advantages of platform ecosystems along three main dimensions. While much of the earlier research on platforms builds on economic models of competition, we conceptualize platform ecosystems as meta-organizations and develop a framework to explain how this perspective can inform platform design and entry, competition between platforms, and competition within platforms. In addition, we highlight opportunities for further research in strategic management on platform ecosystems.

A defining feature of platform ecosystems is the interdependence between a stable core or “platform” that interfaces with a dynamic and heterogeneous set of complementary components to generate a stream of derivative products (Baldwin & Clark, 2000; Jacobides, Cennamo, & Gawer, 2018). For example, eBay as a platform provides standardized and relatively fixed ways of searching and transacting, whereas buyers and sellers are complementors who provide a heterogeneous and constantly evolving set of opportunities to buy and sell. The products offered by the sellers can be seen as the derivative products of the platform.

Given the typical structure of platform ecosystems, it is useful to think of a platform ecosystem as an “organization of organizations,” that is, a meta-organizational form (Ciborra, 1996). Gawer, 2014. Meta-organizations connect multiple organizations, actors, activities, and interfaces, and are underpinned by interrelated social or economic value propositions or business models (Adner, 2017; Gulati, Puranam, & Tushman, 2012; Kapoor, 2018). As such, the success of platforms hinges on cooperation, coordination, and integration across a diverse and often very large array of organizational units and agents, some of whom face conflicting incentives or are direct rivals. This raises interesting issues for strategic management scholars.

Although each organization within a platform ecosystem may be legally independent (i.e., not under common ownership), they often make investments in co-specialization or sign exclusivity agreements that bind them into longer-term relationships. Platform ecosystems are characterized by a large collection of relationships that are neither as limited and specific as spot market contracts, nor as enduring and extensive as those within a hierarchical organization. They can be viewed as hybrid structures between organizations and markets, providing a mixture of market-based and hierarchical power, and a mixture of market-based and hierarchical incentives (Makadok & Coff, 2009; Williamson, 1975). The meta-organizational perspective of platform ecosystems let us study a number of interesting questions regarding authority, incentive structures for participation, governance, and organization design, and even more importantly, it allows us to analyze how platform ecosystems emerge, evolve and interact with competing organizations. We suggest that the unique contribution of strategic management scholars studying platform ecosystems is to connect insights about the organizational nature and structure of platform ecosystems with their strategic behavior.

In the next section, we examine the meta-organizational features of the platform ecosystems that are featured in the special issue articles and show how these features influence their competitive behavior and strategies. Our framework considers the strategic actions of platform ecosystems across three traditional loci of competition: entry, or competition between newly emergent platforms and the traditional industry players that preceded them; rivalry, or competition between different platforms vying for the same market space; and internal competition, or competition for value capture among the members within a platform ecosystem. We conclude by discussing open research questions and emerging trajectories of platform ecosystems research for organizational and strategic management scholars.

2 | HOW META-ORGANIZATIONAL FEATURES SHAPE PLATFORM ECOSYSTEM STRATEGIES

We take a meta-organizational perspective to study the strategic implications for platform ecosystems. For this purpose, we focus on three important features affecting the fundamental nature of organizations: the nature of interpersonal authority (the power of a manager to tell subordinates what to do; cf. Van Den Steen, 2010), the motivation and incentives it creates to attract participants (Englmaier, Foss, Knudsen, & Kretschmer, 2018), and its governance and coordination structures, including property rights to essential assets (Gulati et al., 2012; Hart & Moore, 1990; Holmstrom & Milgrom, 1994). These three key dimensions of organizations, however, may manifest differently in hybrid organizational forms such as platforms (Makadok & Coff, 2009).

In a traditional hierarchical organization, *authority* is based on ownership of the assets necessary for production, and it deploys that authority through employment contracts and the (delegated) power of managers to exclude employees who do not comply. In platform ecosystems, in contrast, the source of authority and power of a platform “hub” largely arises from control over the technological architecture at the center of the ecosystem, and relational centrality among a number of players for whom coordination offers the promise of greater rents. That is, while the payoff to coordination within the ecosystem serves as an incentive, the platform is uniquely positioned to exert control over who participates, the rules of participation, and how rents are allocated. It has both the ability and the willingness to manage this coordination, thereby creating additional value in the platform ecosystem than players could achieve on their own or through dyadic cooperation (Wareham, Fox and Giner, (2014)). Thus, for example, application developers on a mobile application platform accept the terms and conditions and pay platform fees and commissions in exchange for access to the user base, development tools, and opportunities to receive revenue and feedback from the community. As such, the relationship between the platform and the complementors is associated with contractible actions and less managerial discretion, relative to hierarchical organizations.

Another key distinction between platform ecosystems and traditional organizations is the nature of *motivation and incentives*. Whereas a traditional organization usually provides low-powered incentives by directly paying employees recurring wages for their services, in platform ecosystems the incentives and compensation are indirect and high-powered, as they involve business transactions among the participants themselves. Platforms typically enable transactions or interactions among participants that allow them to create value for one another and also capture some of that value. For example, a lodging platform only transfers the payment of the guest to the host and takes a commission for this service. Thus, the host assumes the risk for non-payment or any other damages although the platform can provide assistance in resolving disputes. More generally, in addition to the more conventional “hard” exclusion criteria like Apple screening apps for minimum quality and social networks moderating posts for violations of their conditions (e.g., fake news, copyright violations, hate speech etc.), many platforms provide “nudges” and indirect incentives for desirable quality or quantity of contributions (Claussen, Kretschmer, & Mayrhofer, 2013). For example, platforms may provide valuable resources such as information about what customers want, development kits or APIs, and performance feedback or awards (Rietveld, Schilling, & Bellavitis, 2019). The platform generally steers clear of top-down fixed production schedules and integrated product portfolio choices, and in this sense restores some of the market-like volition and autonomy of participants while still providing some of the guidance and

resource-sharing of a hierarchical organization. Importantly, while market participants can negotiate some terms of their interaction freely, a platform limits the degrees of freedom available to transaction partners.

The way a platform provides participation incentives is critical for its sustained growth and task performance. Note that platforms have been variously categorized based on whether the platform leader plays a critical role in setting standards for interoperability with the platform interfaces (e.g., Microsoft and Apple), controlling the flow of goods and services (e.g., Amazon and Uber), or governing information exchange (e.g., Google and Facebook) (see Baldwin, 2018; Cusumano, Gawer, & Yoffie, 2019). Moreover, platforms may pursue goals other than purely financial ones, for example, the goal of establishing a market for previously non-viable transactions (e.g., crowdfunding platforms) or societal goals (e.g., Charity Miles, Spacehive, Catapult) or a mix thereof whereby different participants derive social and financial benefits (e.g., social networking platforms such as Facebook). Common to all of them is a need for a lively ecosystem of complementors to attract a set of consumers with heterogeneous and often changing preferences and needs. The platform needs to design incentives for complementors and users to join and participate in the ecosystem, and to guide them to contribute in their most valuable way. When participation is voluntary, such incentives must exceed the opportunity costs arising from other ways to pass time or gain income, and they must offset the platform's lower level of direct authority over participants' behavior.

The final organizational feature of platforms we consider is their *governance and coordination* structures, including the allocation of decision rights (or control rights) between the platform provider and the various participants, and the rules that are imposed. In a traditional organization, decision-making tends to be structured hierarchically, where front-line or production-line employees make more limited decisions within their job descriptions than middle managers or top managers who have an increasing span of control and decision rights. Platform ecosystems, in contrast, are populated by autonomous individuals or organizations who independently make decisions within the rules and resources of the platform. Through boundary constraints, incentives, and communication channels, the platform provider defines what participants can do and how they are compensated, but as noted previously, the participants themselves decide if and how they will actually contribute. Consequently, the activities enabled by platforms tend to be structured more independently, relying on modular tasks, standardized technological interfaces, and technology-enabled channels of communication rather than the highly interdependent tasks and the tight hierarchical control and coordination common to many traditional organizations. Thus, beyond the decision to include a participant in the platform ecosystem, the platform provider and the participants split control rights related to their joint value-generating activities. The platform provides development resources and transaction systems, to which it retains decision rights, whereas the participants contribute their own creativity, resources, products and/or services for sale on the platform, to which they retain at least partial control rights. In part, this aligns incentives and residual claims, but it also lets the platform achieve a broader span of control (with less decision-making) than a typical hierarchy, in which actions are mandated, and specified more precisely for subordinates.

Having discussed how platform ecosystems differ from traditional hierarchical organizations, we also need to consider whether and how they differ from traditional markets. Van Den Steen (2010) argues that strong interdependencies between the participants' (non-contractible) decisions (e.g., sequential production lines where one stage's output is needed as input for another stage) drive the emergence of integrated, hierarchical organizations, and weak or non-existent interdependencies are associated with a nonintegrated, market-like regime. We argue that platform meta-organizations tend to emerge when there are intermediate levels of interdependencies

among the participants. While modularity and standardization of platforms help to mitigate interdependencies, everyone in the platform ecosystem is affected by externalities in the form of network effects. When innovations by one participant attract additional users to the ecosystem, other participants are also likely to benefit. Hence, platform ecosystems differ from markets in that governance decisions are made by the central platform that plays an important coordinating role in defining the rules for participation and exchange that ultimately generate network externalities (and other benefits from coordination), and in defining how the benefits from externalities and coordination are distributed among the participants.

Although platform types proliferate and differ in their objectives as previously noted, the platform leader monitors, governs, and balances the interests of different parties (Baldwin, 2018; Baldwin & Clark, 2000)—such as readers and advertisers in news media, drivers and users of ride sharing services, or cooperation and competition among technology firms in standards development organizations. How this leader emerges and by what means it orchestrates the ecosystem, and in whose interests, significantly influences the nature and the competitiveness of the platform ecosystem. In any case, and independent of the ultimate objective function of the platform, the leader represents a “visible” hand of the meta-organization, as opposed to the “invisible hand” of markets.

Taken together these meta-organizational features of platform ecosystems highlight the role of architectural control of the ecosystem as a source of power that replaces formal authority, and the importance of incentives to encourage continued innovation and high-quality contributions. Moreover, the governance structures for communication and coordination, when combined with appropriate terms, conditions, and decision rights, help orient the activities of the platform ecosystem. Table 1 summarizes the meta-organizational features of platforms and helps compare and contrast how these meta-organizational features manifest across the three realms of platform competition that were examined in the special issue papers: the *design and entry of new platforms* and their competition with traditional incumbent firms and regulators, the dynamics of *between-platform competition* when rival platforms compete for a common market; and the *within-platform competition* that determines the allocation of value across ecosystem participants.

All nine studies in this special issue illustrate platform strategies for entry and growth against the backdrop of one or more of these meta-organizational features of platform ecosystems. As Table 1 illustrates, these meta-organizational features influence how platforms compete against traditional organizations, with other platforms and facilitate competition and cooperation within the platform. First, to compensate for their lack of power and authority new platforms that are *entering* established markets and competing with traditional incumbents tend to emphasize the autonomy and flexibility that complementors enjoy on the platform (especially as compared to the spot-market contracts with traditional incumbents). For established platforms competing against other platforms or managing competition on the platform, the emphasis shifts toward architectural control of the ecosystem and the power to distribute profits across participants.

Second, to motivate and incentivize participation, a platform that is entering and competing with a traditional organization must offer novel incentives to attract diverse complementary players and kickstart the network effects necessary to disrupt the established business model. For platforms that are competing with one another, the key to success is not only attracting complementors, but also creating incentives for the complementors to contribute high-quality offerings that serve as a source of differentiation, and ensuring that participants remain loyal and not “multihome” or switch to competitors’ platforms. Once high-quality complementors are present, the platform leader who manages competition on the platform must devise appropriate incentives to motivate the complementors to cooperate and enable value creation.

TABLE 1 Meta-organizational features and platform strategies

Meta-organizational features	Strategic dimensions		
	Platform entry	Between-platforms competition	Within-platform competition
Sources of power and authority	Technological and/or relational hub to facilitate coordination; enables modularity and loose coupling for participant autonomy and flexibility	Architectural control of the ecosystem to capture more value	Power to influence the distribution of profits across stakeholders
Sources of motivation for participation	Incentives to attract participants under uncertainty	Incentives for users, and participants to offer high quality complements that create value in the platform ecosystem; incentives to encourage loyalty	Incentives to balance cooperation and competition with participants
Modes of governance and coordination	Use technology to lower coordination costs and enable search and matching; create technology-based trust and security	Balance rules and decision rights with openness; balance coordination and participant contributions; balance cooperation and competition with other platforms	(De)centralize decision rights to manage cooperation and competition among complementors

Third, the effectiveness of governance and coordination tasks of platform entrants hinges on the ability to leverage advances in information and communication technologies while maintaining trust and security of digital transactions. Furthermore, managing tradeoffs between easy access and flexible contributions (i.e., an open system) and limiting access and the type of contribution (i.e., a closed system) impact the ecosystem's task efficiency and agility. These tradeoffs remain pertinent for *competition between platforms* as well, but now these decisions must be calibrated to the evolving nature of platform competition. The degree of decentralization of decision rights becomes salient in the context of managing competition *within platforms*. Decentralization of decision-making can incentivize cooperation among participants when there are valuable complementarities that can be realized through co-development or innovation.

In the following sections we elaborate on the implications of these meta-organizational features for platform competition as showcased in the papers appearing in this special issue.

2.1 | Design and entry of new platforms and competition with incumbents

Platform ecosystems often displace more traditional forms of organizing such as markets or hierarchies. A growing literature has examined platform-incumbent dynamics in various industry settings (Paik, Kang, & Seamans, 2018; Seamans & Zhu, 2014, 2017). When firms introduce

a new platform business model into an industry context that had not been previously characterized by platforms, they typically disrupt the revenue streams and balance of power of existing incumbents. In this issue, joining these prior studies, Chang and Sokol examine the response of Taiwanese hotels to the entry of Airbnb, and Garud et al. show how Uber navigated the challenges posed by incumbents such as regulators across various U.S. jurisdictions.

Both Chang and Sokol (2020) and Garud, Kumaraswamy, Roberts, and Xu (2020) highlight the key meta-organizational features of platforms and their implications for the platform-incumbent dynamics. First, when a platform such as Uber or Airbnb enters a market that was previously characterized only by hierarchical firms, it offers an organizational arrangement that is likely to be significantly less restrictive than those offered by incumbents. By offering an alternative to authority through flexible participation agreements, for example, modes and extent of employment, and an ecosystem that complementors can join and leave easily, these platforms can attract participants that prefer more autonomy over how they conduct their activities. Second, for new platform organizations entering industries that were previously populated by hierarchical firms, crafting an effective incentive strategy can be extremely challenging. Without exemplars of successful platforms in the industry it can be hard to convince complementors to join because takeoff seems too uncertain, leading to a chicken-and-egg problem (Caillaud & Jullien, 2003) of attracting enough complementors and consumers, while each of these market participants has little incentives to join without sufficient presence of the other. Without benchmarks of existing platform models it can also be difficult to know what incentives will work and what will not, leading to rule changes along the way (Claussen et al., 2013). Third, one of the most critical platform governance questions that a platform innovator must address is the degree to which the platform ecosystem will be “open.” The degree of openness is determined by the choice of members, the explicit criteria for membership, and the duration and exclusivity of membership, which in turn impacts overall competitiveness. When a platform’s rules make it easy for all willing parties to join, the large number and heterogeneity of complementors can make it more challenging to ensure coordination and completion of specific tasks (Boudreau, 2017). At the same time, a larger number of participants make it more likely that innovations and desirable exchanges occur. Consequently, strategies that effectively leverage a platform’s meta-organizational features become key for attracting not only customers whose needs were unmet by the traditional firms in the market, but also for managing platform complementors.

The two studies concerning platform entry in this issue are also distinctive to the extent that while Garud et al. illuminate the processes through which the platform entrant navigates the challenges associated with its novel organizational form, Chang and Sokol examine the incumbent’s response to platform entry. In particular, in their study of Uber, Garud et al. make the important point that while platforms that create modular production systems of loosely coupled participants offer a number of flexibility advantages in terms of driver participation, hours kept, regions served, and other aspects of service, the resulting heterogeneity in available services (e.g., speed of pickup, quality of car, phone charger availability, degree to which driver converses with passenger, etc.) may also go against existing institutional norms and create legitimacy challenges to their entry (e.g., Kuratko, Fisher, Bloodgood, & Hornsby, 2017; Mair & Reischauer, 2017). The platform may therefore need the support, or at least tolerance, of market players who do not even understand the new business model, or may not condone it, leading to both “cognitive illegitimacy” and “sociopolitical illegitimacy” (Aldrich & Fiol, 1994).

Garud et al. (2020) show how Uber navigated this challenge by deploying a number of market strategies including partnerships, offering economic incentives, and staging high visibility

events. In addition, Uber also employed non-market strategies such as circumventing regulation by arguing that it was a technology company rather than a taxi company, fighting state and local labor boards' attempts to categorize drivers as employees, hiring lobbyists to influence regulators, and aligning itself with Mothers Against Drunken Driving. Garud et al. (2020) describe this process as "liminal movement": The firm attempts to establish itself between existing regulatory categories, and, through its own actions, it intends to change the market environment and the beliefs of regulators and other stakeholders.

Chang and Sokol (2020) point out and document that by offering a loosely coupled and modular organizational system, a platform such as Airbnb can offer specialized products targeted toward participants with heterogeneous capabilities and preferences (Schilling & Steensma, 2001). Moreover, a loosely coupled and modular organizational system allows platforms to become more adept at responding to evolving market demands and preferences. However, in contrast to Garud et al.'s focus on the platform's strategies, Sokol and Chang elaborate on the incumbents' responses. Prior research has shown that incumbents may respond by retaliating in some way against the new entrant—for example, by lobbying for regulation that makes it difficult for new firms to enter or compete (Paik et al., 2018), or shifting their strategies to differentiate from the newcomer (e.g., Seamans & Zhu, 2014, 2017). Seamans and Zhu (2017), for example, show that whenever Craigslist entered a newspaper's geographic market, the newspaper repositioned itself away from Craigslist by changing its content or by cutting cost. Interestingly, Chang and Sokol (2020) find that the incumbent hotel's response to Airbnb's entry depends on the original positioning of the hotel: low quality hotels responded by competing on price with Airbnb, but high-quality hotels responded by increasing their investment in service quality to differentiate from Airbnb. Hence, platform entrants occupy specific competitive spaces which trigger heterogeneous responses by incumbents. This in turn suggests that platform entry into established markets may cause a reshuffling of the overall industry structure rather than lead to rapid wholesale replacement of the existing players and that different strategic groups are affected differently by platform entry.

2.2 | Between-platform competition

Competition between platforms is one of the most developed areas of platform ecosystem research, though early work in this domain more commonly used the phrase "standards battles" or "standards competition" (e.g., Church & Gandal, 1992; Cusumano, Mylonadis, & Rosenbloom, 1992; Schilling, 2002; Shapiro & Varian, 1999). This line of work typically focused on how platforms use price (e.g., Brynjolfsson & Kemerer, 1996; Gandal, 1994; Parker & Van Alstyne, 2005), investments in quality (e.g., Choi, 1994), and subsidization or provision of complements (Kretschmer & Claussen, 2016; Rietveld & Lampel, 2014; Riggins, Kriebel, & Mukhopadhyay, 1994; Schilling, 2003) to their advantage given strong network externalities.

The four studies by Khanagha, Ansari, Paroutis, and Oviedo (2020), Panico and Cennamo (2020), O'Mahony and Karp (2020), and Dushnitzky, Piva, and Rossi-Lamastra (2020) bring into focus how the meta-organizational features of platforms influence the competitiveness of platforms in ways that have only recently attracted research attention. In particular, Khanagha et al. illustrate that although platforms offer an organizational system with less explicit authority over participants than in a traditional hierarchical firm, one of the key goals of a platform leader is to gain architectural control in the market that will enable it to capture

more of the value that is created. This involves the power to define how the overall product system works together, to control what is compatible and what is not, and to direct its innovation trajectory (Schilling, 2000). Witness the position of Microsoft and Intel since the 1980s until very recently—their architectural control over the “Wintel” personal computing ecosystem let them shape the industry to their advantage, and gave them myriad ways to profit from the industry. Consequently, gaining architectural control in a market can be highly lucrative. Khanagha et al. (2020) illustrate the case of Cisco which seeks to move into a position of greater architectural control while hoping to retain the support of a platform for whom it serves as a complementor. They conduct an in-depth case study of the cloud computing market, and trace the moves of Cisco (who had been a complement producer of network equipment for cloud computing), as it introduced “Fog”—computing power and storage that is at an intermediate point between local computing (“Edge”) and centralized computing (“Cloud”). Rapid growth in the “Internet of Things” had revealed the need for decentralized data processing closer to devices which had given rise to Edge computing. Cisco wanted to become the dominant platform in the space between Edge and Cloud in the form of “mini-clouds” located near the physical devices. Khanagha et al. show how Cisco avoided head-to-head competition with cloud incumbents such as Amazon and Microsoft through a series of moves that helped preserve Cisco’s role as a complementor for cloud computing while capturing architectural control over a part of the market that cloud providers were relatively slow to develop. Cisco’s case shows that gaining architectural control for a platform involves complex strategic moves which may involve carving out a specific market niche while maintaining synergistic relationships with rivals to develop a viable ecosystem.

Another key organizational aspect of many modern platform ecosystems, as Panico and Cennamo (2020) highlight, is that platforms compete primarily through incentivizing a robust and high-quality group of participants to join, and by offering a seamless transaction environment. Such incentive strategies may help a platform gain a competitive advantage over rival platforms, but they also carry a cost: the more generous the incentives for complementors, the lower is the value captured by the platform. Panico and Cennamo (2020) examine a different aspect of offering incentives to attract complements: the effect of congestion costs—that is, when complementors on a platform suffer from the presence of too many other complements with which to compete—on ecosystem quality. In a formal model, they show that the nature of increasing returns for complementors determines the interplay between the quantity and quality of the complementor ecosystem. Interestingly, if network effects for complementors are weakening with their network size, a larger network of complementors will dilute complement quality and result in worse (less innovative) complements on average. More broadly, their study shows that *ex ante* investment incentives for value creation by complementors in the form of a larger share of the value created lowers *ex post* value capture by the platform, and vice versa.

These dynamics of managing complementors for value capture are also evidenced in practice. For example, in their race to capture both drivers and riders, Lyft and Uber have racked up huge losses through subsidies to both drivers and riders. In 2018 Uber lost an average of 58 cents per ride on the 5.2 billion rides it gave (Rushe, 2019). Both companies are counting on building up large (local) network effects so that drivers choose their platform to get more riders and riders choose their platform to get faster access to rides. Yet despite this heavy subsidization, neither company has created a strategy that increases switching costs for either the riders or drivers, or prevents “multihoming” (Cennamo, Ozalp, & Kretschmer, 2018) whereby complementors work across multiple ecosystems. This highlights that carefully employing

incentives to orchestrate the behavior of users and complementors is necessary to ensure that the network benefits of such subsidies are not easily eroded.

In a similar vein, O'Mahony and Karp (2020) examine the question of how centralization versus decentralization of decision rights, a key consideration of platform ecosystem design and governance, influences participation on a platform: centralization facilitates coordination and accelerates decisions, whereas decentralization encourages broad participation and engages information from a wide range of participants. Which benefits dominate depends on the nature of the ecosystem's products, participants, and markets. Using an in-depth case study of the Eclipse software development platform, O'Mahony and Karp (2020) develop a process model that explains how and why an ecosystem transitions between centralized and decentralized governance over time. They find that external firms' participation depends crucially on platform governance. Notably, participation is not a binary choice, but firms adjust their intensity of participation depending on platform design and governance. Participation was found to decrease if platform leadership was ambiguous, highlighting the need for the allocation of decision rights as a coordinating mechanism. Furthermore, for most external firms in their sample, participation increased as the Eclipse platform transitioned from a proprietary platform controlled by IBM to an increasingly open design with fully distributed platform leadership. Thus, platform openness emerges as a key governance choice when considering platform competitiveness.

Finally, in their study of crowdfunding platforms, Dushnitzky et al. demonstrate that one of the interesting features of platforms is that their design and pecuniary incentives interact in more complex and strategic ways than traditional firms. For example, crowdfunding platforms choose a set of strategy parameters like the degree of specialization in products and services offered and the markets served, and allow for listing of crowdfunding projects within these parameters. In their quantitative-inductive study, Dushnitzky et al. (2020) identify strategy archetypes of crowdsourcing platforms. They focus on key design features such as the nature of payment systems employed (e.g., subscription, transaction fees, etc.), the symmetry of payment across market sides, and control over the markets served and the scope of activities offered on the platform. Taken together, these design features set the incentives for each market side and, as such, define the quantity and types of investors and projects that join. Dushnitzky et al. identify strategy "bundles" or archetypes, suggesting that these practices are complementary. However, they also find that small differentiation moves within a strategy archetype increase the probability of survival. Thus, platform competition hinges on orchestrating and governing the activities of participants toward a healthy ecosystem.

2.3 | Within-platform competition

An issue that has received increasing attention are the common and conflicting goals of platform owners and complementors (e.g., Ghazawneh & Henfridsson, 2013; Zhu & Liu, 2018). This cooperative tension is particularly important for platform leaders providing complements themselves (so-called "first-party complements"), which can have the dual effect of crowding out the provision of complements by third parties, while "seeding" the market with high-value complements (Niedermayer, 2013; Ozalp & Kretschmer, 2019; Pierce, 2009). Three studies by Zhang, Li, and Tong (2020), Miller and Toh (2020), and Logue and Grimes (2020) illustrate that strategically managing platforms requires a careful understanding of how to balance cooperative and competitive tensions between interdependent members under the shadow of probable future interactions (Jones, Leiponen, & Vasudeva, 2020; Vasudeva, Leiponen, & Jones, 2020).

Zhang et al. (2020) demonstrate how platform boundaries influence the willingness of platform participants to cooperate. When the platform is open and attracts many complementors, the value of the platform grows. However, the resulting competition among complementors may make it difficult to achieve any cooperation. Zhang et al. (2020) use a quasi-experiment in the mobile app developers' community to show that after the iOS "jailbreak" that overcame the protection of the iOS source code, the developer community suddenly expanded because Apple's ability to maintain gatekeeping was compromised. As a result of this expansion, software developers on the iOS platform became significantly less likely to share knowledge with each other. Consequently, when a platform design promotes competition among complementors, they may sacrifice productive cooperation among complementors that can enhance quality and instill cohesion and trust in the ecosystem. The findings from this study show that a platform provider has the complex strategic task of orchestrating both the ecosystem value creation and the distribution of that value among its members. It achieves this balance through various tradeoffs involving the quantity and quality of complements, competition versus cooperation between complementors, and the platform's own cooperation versus competition with complementors.

In a related vein, highlighting the cooperative tensions in the context of standard setting, Miller and Toh (2020) show that member firms may voluntarily make available some of their patents to everyone under reasonable and non-discriminatory licensing terms. However, such a strategic move may subsequently lock ecosystem partners into choices that increase the patent holders' profits from their non-disclosed complementary patents. More generally, platform participants will strategically consider which assets or capabilities they will offer via the platform and which ones they exploit off platform.

Finally, in contrast to most studies that focus on the cooperative tensions in for-profit platforms, Logue and Grimes (2020), tackle the more complicated question of how platform leaders manage social mission platforms where consensus and cooperation may be harder to achieve. Using a case study of a civic crowd-funding platform called Spacehive, they build a process model of how the platform leader negotiates challenges regarding user growth: the legitimacy, participation, and exchange dilemmas all occur at different stages of the platform's lifecycle requiring both platform integration (i.e., a tight coupling of platform activity with the platform's stakeholders) and platform adaptation (i.e., leaving more degrees of freedom to the platform participants). This study again illustrates the importance of achieving a delicate balance between coordination across platform participants and motivation of participants to participate through decentralized decision rights.

In sum as these studies reveal that, to manage within-platform competition, platform developers need to consider the distribution of the created value among participants. Platforms express authority over platform boundaries, rewards, and benefits that can be used to balance the tendencies of participants to cooperate and compete. The engagement of participants also depends on the degree of (de)centralization of decision rights. The distribution of decision making, for its part, further influences rivalry and collaboration among participants.

3 | FUTURE RESEARCH DIRECTIONS

Despite the rapid emergence of relevant and rigorous strategy research on platform ecosystems, there are still many more questions to be answered in addition to the ones featured in this special issue. We organize our ideas for future research encompassing the meta-organizational features along the three dimensions of platform strategy as shown in Table 1.

3.1 | Modularity, incentives and technology in platform design and entry

While the battles between newcomers and incumbents (Santos & Eisenhardt, 2009; Tripsas & Gavetti, 2000) have long been an important question for strategy research, entry by a platform business model that departs from the established traditional organization along many fundamental organizational facets poses its own unique challenges (Hannah & Eisenhardt, 2018). With respect to new platform entry, we still know relatively little about strategies that new entrants employ for modular design and loose coupling while overcoming the classic “chicken-and-egg” problem of attracting enough complements and consumers. While the question of which market side to subsidize has been addressed extensively by the early platform pricing literature (see, e.g., a recent review of the platform competition literature in Rietveld & Schilling, 2020 or McIntyre, Srinivasan, Afuah, Gawer, & Kretschmer, 2020), alternative strategies have been explored much less and include, for example, encouraging multihoming or compatibility between the incumbent and the new platform (Kretschmer & Claussen, 2016), bundling the platform with a set of complements (Zegners & Kretschmer, 2017), or limiting technological complexity and requirements of the platform to attract complements (Cennamo et al., 2018; Claussen, Essling, & Kretschmer, 2015). While this and related work capture some specific aspects of platform entry strategies, considerably more remains to be understood about the strategies entering platforms use and how they affect market outcomes.

Relatedly, what strategies should an industry incumbent employ for assembling an ecosystem of complementors, relative to a new platform entrant? In the early 2000s, Warner Music teamed up with BMG, EMI, and RealNetworks to introduce a subscription digital music portal called MusicNet, while Sony Entertainment and Universal partnered to create a similar service called Pressplay. Both failed because other prospective complementors would not join—they viewed the incumbents as too threatening. Instead Apple, which did not have a position in music content at the time, successfully introduced iTunes by striking agreements with all five of the major record labels (Sony, Universal, BMG, Warner Music Group, and EMI), which subsequently helped it attract the smaller labels as well. This anecdote suggests that under certain industry conditions a new entrant such as Apple may occupy a more advantageous position in offering the benefits of modularity, loose coupling, and flexibility of joining and designing complements to secure the cooperation of the necessary complements for a platform than any of the incumbent firms with a strong position in the complements. Conversely, traditional organizations can usually build their market position more gradually over time, especially when they are not depending on voluntary participants and the network effects among them. These observations raise important questions regarding how to design platforms and align participants' incentives with the required platform tasks and business model to foster the level of participation and innovation necessary to reach the critical mass for take-off.

Future research may also investigate the geographical, technological, or institutional conditions under which platform entry may be particularly advantaged owing to the value created by their search and coordination capabilities that enable the matching and interaction between distant and previously unconnected parties. Platforms that compete with traditional incumbents arise most rapidly in digital contexts where the design of the platform's communication system can structure the very core of the task environment. The communication system defines which participants communicate with which others, using what format, and regarding what content. For example, Airbnb provides a coordination structure that allows for a very well-designed search functionality to find hosts anywhere in the world, and it encourages direct social communication

among hosts and guests, but it excludes off-platform communication to prevent offline transactions that endanger its ability to take commission. HomeAdvisor similarly provides a well-designed search functionality for users to identify potential home service providers and to compare prices and reviews. It does not, however, merely provide a directory service; it arranges for service providers to contact the potential customers with bids and follows up on the quality of the transaction. In both of these cases, the core value proposition of the platform is to use information technology to lower the search costs for customers to identify and compare more potential service providers and to lower the costs for service providers to gain exposure to a wider market. In both cases the platforms are also providing a form of branding that helps the user to feel more comfortable transacting with an unfamiliar party with whom they are likely to transact only once. It follows from these observations that a key characteristic of new platforms that can successfully challenge incumbents are the governance features that lower coordination costs relative to traditional forms of organizing, while still providing a sense of trust and safety.

While many platforms have arisen specifically because they could connect disparate and often geographically or cognitively distant participants in mutually beneficial relationships, nothing prevents traditional organizations from taking advantage of improvements in communication technologies. Future research could thus investigate which traditional organizations may be best suited to harness the benefits of the fleeting “digital trust” which, to everyone's surprise, is often sufficient to enable productive exchange for platform organizations (Gu & Zhu, 2020). On the flip side, emergent risks related to data privacy and data security (Say & Vasudeva, 2020) could increase the transaction costs for platforms, reversing the course in favor of traditional organizations (Brynjolfsson, 1994).

3.2 | Architectural control, incentives and governance in platform competition

Despite the wealth of research on between-platform competition there is still considerable opportunity for important research in this realm. For example, when the crisp boundaries of asset ownership and employment contracts in traditional organizations are replaced with the modular design and permeable boundaries of platforms, the relationships between organizations in the industry can become fuzzy. A platform ecosystem may also become embedded within another platform ecosystem with whom it hopes to sustain a synergistic relationship. Furthermore, the competitive relationship between two platforms is decidedly multisided: platforms compete for the support of complementors and customers alike, and they often have significant discretion over the range of activities that will be offered within the ecosystem. This kind of complexity raises questions of how to gain architectural control and structure the incentives and decisions about governance and coordination.

In particular, there are still questions regarding how firms manage the cooperative and synergistic relationships between platforms. For example, Airbnb initially rode on Craigslist's success, colloquially known as the “Craigslist Hack.” Zynga Games (e.g., Farmville) on Facebook and PayPal on eBay have grown and achieved scale in this same manner, that is, as start-ups riding on the success of a much larger platform. As an OECD (2019, p. 86) report notes, “These relationships [with other platforms] can be opportunistic, synergistic, or parasitic, and possibly all three.”

Strategies that expand the scope of platforms and their architectural control abound, as evidenced by Facebook's acquisition of Instagram in 2012 and WhatsApp in 2014, Alibaba's

operations in a wide variety of e-commerce, digital media, and finance platforms, and Amazon's operations in an online transaction platform, Marketplace, technology product platforms, Kindle and Alexa, movies, books, and music platforms, and a cloud service platform, Amazon Web Services. Yet, we know relatively little about value creation from mergers and acquisitions between platforms and platform diversification, and to what degree these merger, acquisition, and diversification strategies of platforms are similar to or different from those of traditional firms.

A key aspect of platform governance that affects between-platform competition is the extent and nature of coordination among participants. Again platforms face a tradeoff: If coordination is highly centralized—that is, technical specifications and user interactions are managed closely, lead times tend to be longer but the overall ecosystem will have lower redundancies and “blind spots.” However, the policy of letting “a thousand flowers bloom” (Boudreau, 2012) may create higher dynamism and enhance the platform ecosystem's ability to react to subtle changes in consumer preferences and possibly serve niche communities. Although an extremely open platform ecosystem may bring in a lot of creativity, platforms need to adopt the appropriate governance features to avoid what the video game industry has termed the “Atari shock”—an influx of low-quality complements as a result of excessive openness. Consequently, many platforms choose intermediate solutions both in terms of their coordination and in participants' ability to contribute to the platform's tasks and activities, and they restrict the segments or domains in which complementors can contribute and users can choose to achieve a more focused ecosystem (Halaburda, Piskorski, & Yildirim, 2018). In this vein, future research could examine the appropriate coordination mechanisms, decision rights and procedures for approval and policing that will allow platforms to exercise some control over the task environment and achieve a minimum quality of complements to reach their strategic goals.

Future studies could also investigate the dynamic and evolving nature of participation and the challenges this creates for the platform, since the value of the platform depends to a large extent on the number and type of complementors and users at any moment in time. For example, in a large-scale study of the videogame industry, Rietveld et al. (2019) found that consoles were much more likely to endorse games for release during slow periods of the market to reinvigorate attention to the console and to balance cash flow. The importance of temporal effects is also clearly evident in Uber and Lyft's use of surge pricing to compete by attracting more drivers during periods of high ridership.

3.3 | Incentives and governance within platforms

Last but not least, important questions remain about what strategies platforms use to manage within-platform competition. For example, future research may examine how platforms distribute profits and manage the tradeoffs between fostering competitive versus collaborative relationships among complementors. Although most research on platforms has focused on for-profit ecosystems where the profit motive provides some degree of incentive alignment, even social platforms need to orchestrate the behavior of ecosystem members, ensuring they come together in synergistic ways.

In operating systems, Microsoft, Apple, and Google all have strong positions in first-party complements and this does not seem to have hindered gaining the cooperation of third-party complementors. In fact, it may have been crucial for them to supply key complements necessary for the health of the ecosystem. The success of third-party complementors in operating systems however, has not proven to be true in industries such as videogames. In videogames, for example,

the platform owner must nearly always produce first-party content to overcome the chicken-and-egg problem since consoles cannot be sold without games and games cannot be sold with an installed base of consoles. So console makers produce games to launch with the console. Which logic will prevail in the market for streaming movies and television content? The answer would speak directly to the likelihood of success of firms like Disney, Netflix, and Amazon, all of whom are attempting to compete as both platform providers and content providers.

The platform owner also needs to define how ongoing decisions are made about the platform's evolution: Which decisions are "farmed out" to the community and which decisions are made centrally by the platform provider? While many consumer platforms have highly centralized decision making, others are owned and coordinated by the community itself, decentralizing the decision rights to committees or experts (e.g., Wikipedia). Some platforms (e.g., Stackoverflow) may even adopt cooperative governance whereby all or most decision rights are centralized to a core group of decision-makers.

As discussed in the preceding section, open versus closed platform ecosystems are an important governance choice with implications for a platform's influence over its members. Thus, future research could examine trade-offs pertaining to a high redundancy of member capabilities in open-source communities which enhances the bargaining power of the platform owner and residual profits because members compete with each other, but increases coordination costs for the platform. Studies could also investigate the costs and benefits of exclusive membership preventing participants from multihoming or joining competing platforms. Platforms that must allow multihoming, such as the ride-sharing platforms discussed previously, face tougher competition for participants (e.g., drivers and riders). In contrast, in closed ecosystems with explicit, tailored, and negotiated set of tasks, roles and relationships, unique members with strong complementary contributions to the platform may occupy a more powerful position to negotiate for profits.

Finally, content development platforms like Wikipedia and standard development organizations like 3GPP rely heavily on collective innovation among the participants (Bar & Leiponen, 2014; Leiponen, 2008) and benefit from a common underlying institutional logic (Vasudeva, Alexander, & Jones, 2015). While these platforms have high degrees of openness to ensure innovation, future research could examine their governance choices in terms of the structure of information sharing, including contributions of technology or user-generated content, credit attribution, and self-regulation of quality all of which are key ingredients to attract participants and steer them toward high-quality contributions.

In sum, strategy research on platform ecosystems has generated important insights about organizationally complex and economically meaningful questions. While this special issue advances research on platform ecosystems and takes stock of what we know so far, it also opens up new avenues for research. By conceptualizing platforms as meta-organizational forms, we contribute to the understanding of how platforms depart from traditional organizations and leverage their novel organizational features to develop effective strategies for managing cooperation and competition in their ecosystems. By developing this perspective we hope to inform and inspire future strategic management research on how new platforms establish themselves against traditional incumbents as well as how competition plays out between and within platforms.

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