Managed Ecosystems, and Translucent Institutional Logics: Engaging Communities

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ABSTRACT

When organizations need input into their innovation or production process, they have traditionally been faced with the decision to make the input themselves or buy it through the market. However, rapidly decreasing information costs allow firms to harness external communities that are neither employees of the firm hierarchy, nor traditional contracted market participants such as supply chain partners. We introduce the *managed ecosystem* governance form in which a central organization engages external communities and also manages them by maintaining some degree of control over community activities. This model is evident in various organizational approaches including multi-sided platforms, crowdsourcing, and the gig economy. Building upon the knowledge-based view of the firm, we argue that these increasingly common governance models offer a wealth of opportunities, but require organizations to adopt a translucent institutional logic that is in-between the traditional closed logic of the firm and open logic of the market. To successfully employ this model, firms must learn to shepherd communities, leverage them without exploiting them, and share intellectual property rights.

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Managed Ecosystems, Open and User Innovation Strategy, Multi-sided Platforms, Knowledge-Based View, Institutional Logics, Capabilities, Communities, Information Costs

I. INTRODUCTION

With the advent of the Information Age, governance modes emerge that increasingly rely on engagement with external communities of contributors. Organizations adopting these are becoming key forces in the global economy. Facebook, Alphabet/Google, Alibaba, Uber, and similar organizations were designed with an essential element of their strategy being contributions of complementary activities from external parties in a manner different than traditional supply chains, alliances, joint ventures, and acquisitions (Lee and Kapoor, 2017). Incumbent firms such as General Electric, LEGO, Havas, and other well-known multi-national firms are also adopting strategies enabling value creation through building, nurturing, and managing external communities.[1] While many of these governance modes are not new, such as facilitating matchmaking markets and encouraging accessory products and services, dramatically decreased information costs are sparking massive increases in their use and scope. App stores from Google and Apple that offer millions of third-party software apps to add value to smartphones and tablets (Yin, Davis, and Muzyrya, 2014), and digital platform firms such as Airbnb that link hosts and guests and receive $30B+ market valuations are examples of firms harnessing these governance forms. The goal of this paper is to answer the following research questions. First, how can we extend traditional managerial concepts like transaction cost economics (TCE) and the knowledge-based view of the firm (KBV) to more fully understand such governance modes? Second, what form do institutional logics take in managed ecosystems and how do institutional logics shift in incumbent organizations that are transitioning to such

[1] Note that we adopt the definition of communities put forth by O'Mahony and Lakhani (2011) as "voluntary collections of actors whose interests overlap and whose actions are partially influenced by this perception." (p. 4) In related literature, there is a growing discussion of distinctions between *communities* and *crowds*. In this paper, we use the term communities broadly defined, which may on occasion also encompass the notions of crowds. For example, when firms adopt a *managed ecosystem* model of crowdsourcing innovation practices, we consider this to include interactions with a large community of innovators.

forms? Finally, what types of tensions emerge in organizations that adopt hybrid approaches (grappling with dual, potentially conflicting, institutional logics)?

To answer the above questions, we start by considering the related concepts of recombinant innovation and dramatically decreasing information costs. Together, these two phenomena both push and enable organizations to embrace large-scale community-centric engagement. Recombinant innovation leads to an exponentially increasing solution space that must be searched by organizations seeking innovative solutions. The expansion of the solution space is sped up by the sharp decrease in information processing, storage, and communication costs. At the same time, decreasing information costs also allow firms to more efficiently engage and manage large communities of external contributors to better search this expanding solution space. This applies to both entrepreneurial start-ups and also incumbent organizations rooted in more traditional, closed, inward-centric governance modes.

We build upon TCE and KBV by introducing the *managed ecosystem* governance form, in which a central organization both engages external communities and manages them by maintaining some degree of control over community activities. This encompasses situations where a central orchestrating organization manages ecosystem interactions such that the locus of control is within an organization, while the locus of activity is outside organizational boundaries. This intersection of exerting high-levels of organizational control coupled with managing external activities is not fully addressed by either TCE or KBV, yet organizations are increasingly employing this governance mode. We provide a variety of examples of this governance form, including multi-sided platforms and open/user innovation. We also consider boundary condition concepts such as the commons, collective intelligence, and open source software, which are sometimes managed ecosystems and sometimes not.

In many ways, the managed ecosystem governance mode represents a *translucent hand* that is in between the invisible hand of the market and the visible hand of organizational hierarchy. The level of translucency varies depending on the level of control the organization

exerts over the activities and interactions of the community. For example, when comparing Apple's App Store with Google's Android Market, both of which are managed ecosystems used for third-party smartphone and tablet applications, Apple exerts a much greater degree of control than Google does by having stricter rules and a more stringent approval process. Thus, the Android Market is more translucent than the more tightly controlled (thus more opaque) Apple App Store. We explore organizations adopting the managed ecosystem governance form and apply the notion of translucency to institutional logics (Friedland and Alford, 1991; Thornton and Ocasio, 2008; Thornton, Ocasio, and Lounsbury, 2012).

After defining and examining the managed ecosystem governance form and translucent institutional logic, we consider what happens to organizations that transition from traditional hierarchical governance modes (Chandler, 1962) to managed ecosystems. Such transitions happen throughout all aspects of an organization's innovation and production processes. We argue that to successfully adopt the managed ecosystem governance form and translucent institutional logics, organizations develop the capabilities to: shepherd communities, leverage communities without exploiting them, and share intellectual property (IP) with external communities. These capabilities are not integral when an organization operates under a purely hierarchical governance model. Finally, we consider that many incumbent organizations only transition to the managed ecosystem governance form in some of their activities while still maintaining a hierarchical governance mode for other activities, and thus become hybrids. Therefore, with such hybrid governance models, organizations deal with dual (and sometimes multiple and conflicting) institutional logics causing tensions within the organization as it manages internal employees and resources as well as external communities.

In answering the research questions discussed above, we aim to shed light on organizational transitions that are well underway, but that are understudied in the strategy, innovation, and organizational literatures. The research considering these new organizational forms is often fragmented and focused on specific narrow areas of the phenomena. Instead, we

take a more wholistic approach focusing on the unifying factors that face all organizations employing a managed ecosystem governance model. Further, the existing literature has rarely considered incumbent organizations that shift to utilizing a managed ecosystem governance model. Therefore, we examine the difficulties organizations face as they transition and also consider the balance organizations strike as they adopt hybrid forms and use dual, potentially conflicting logics managing traditional hierarchical governance methods concurrently with a managed ecosystem mode.

The paper proceeds as follows. In the next section, we consider how the processes of recombinant innovation and decreasing information costs enable new methods for searching the exponentially growing innovation solution space. Then, we build upon TCE and KBV theories to define the managed ecosystem construct and provide examples and boundary conditions. We then use institutional logics to present our propositions for understanding the practices, routines, beliefs, and capabilities necessary for successfully adopting the managed ecosystem governance model. In the penultimate section, we discuss the implications of this process and extensions to related areas. In the final section we consider future research avenues and conclude.

II. INNOVATION AND INFORMATION COSTS

This section examines two important phenomena that help set the stage for the exploration that follows. We discuss the process of innovation, and highlight its recombinant nature where existing innovations are combined to create new innovations. This process leads to an exponentially increasing solution space that firms can search to find answers to innovation problems. We further discuss prior work on dramatically decreasing information costs and their impacts on innovation.

II.A Recombinant Innovation

The classic Latin phrase "nihil sub sole novum", or "there is nothing new under the sun", pithily encapsulates the essence of recombinant innovation. All innovations include some combination of prior innovations. This notion has been studied in the management literature (Fleming, 2001; Murray and O'Mahony, 2007; Carnabuci and Operti, 2013), the economics literature (Furman and Stern, 2011; Schumpeter, 1942), and the history of science literature (Hargadon, 2003). Critically, this process leads to the number of new combinations increasing *exponentially* over time.

One way to envision this is that at a particular point in time there are a set number of pieces of knowledge in the world. If that amount of knowledge continues to double each year, then there is exponential or extremely rapid accelerating growth of knowledge.[2] This exponential growth of possible solutions to innovation problems dramatically increases the solution space, and possible interdependencies between solutions, that firms can consider as they attempt to innovate and compete (Gavetti and Levinthal, 2000; Jeppesen and Lakhani, 2010; von Hippel, 1994). This is particularly evident in highly modular technological solutions (Baldwin and Clark, 2000; Baldwin and von Hippel, 2011; Furlan, Cabigiosu, and Camuffo, 2014) that enable cross-vendor and cross-domain innovations.[3] With today's acceleration of technological innovation, and the improving ease of access to solutions, this solution space is growing dramatically and becoming more complex, making it harder for firms to find an optimal solution to their problems. Axiom 1 summarizes this situation.

AXIOM 1. *Recombinant innovation leads to an exponentially increasing solution space that organizations search to find novel innovations.*

[2] For example, if at time *t* there are *n* pieces of knowledge in the world and one way that new knowledge is created is by recombining these pieces two at a time, then there are $n * (n-1)$, or nearly n^2, potential new outcomes in time $t+1$.

[3] An example of this is Android Auto, which enables a traditional auto vendor, such as Ford, to embed modern software in a traditional automobile. To this software, other developers can add applications utilizing interfaces in an open and modular system.

Figure 1 helps to illustrate the complexities that arise from this process.[4] In each panel, the height of the peak represents the quality of the solution to an innovative problem based on the recombination of ideas along the vertical and horizontal axes. In the first panel (equivalent to the early history of humankind), there is only one *best* solution and it is easy to find since the search space is relatively small, and there are no interdependencies with other solutions. In the second panel (equivalent to the more recent history of humankind), the solution space has grown and now includes many *good* combinatorial solutions, some of which are interdependent upon each other, but still only one *best* solution. Finding the best answer is now more complicated than in the first panel because if a firm (or individual) starts to climb a good, but not the best, peak, successive innovation may lead them to a better answer on the peak they are on, but they may never realize that there is another (possibly nearby) peak that is even better and that solution will go undiscovered. The final panel shows an exponentially larger solution space with hundreds, or even thousands, of possible *good* solutions (many peaks) to one innovation problem. Such a solution space is nearly impossible for one firm, let alone one person, to explore by themselves (Wuchty, Jones, and Uzzi, 2007; Jones, 2009). It requires expertise in all relevant innovations and requires time and resources to examine all possible combinations of such innovations. To efficiently search such a large solution space requires large-scale community-engaging innovation methods that allow a firm to harness resources that exist well beyond its own boundaries.[5] Such methods are discussed further in Section III.

[4] Note that in this paper we use two dimensional grids to schematically represent solution spaces, but we do not follow the conventions adopted in NK modeling where interdependencies of solutions affect the ruggedness of the landscape, though adding interdependencies would increase complexities in solution spaces even further and align with the observation that solution spaces continue to become more difficult to navigate (Gavetti and Levinthal, 2000).

[5] As an analogy, one can consider pico-satellites. To more efficiently explore the vastness of space, it has been proposed that rather than send one large, expensive satellite with lots of scientific equipment into the universe and hope it stumbles across something interesting, we should instead send thousands of small, cheap satellites with limited equipment in a thousand different directions. These "pico satellites" could phone home to alert scientists to more promising areas to later send larger satellites. In innovative solution space, external communities can likewise be used to cheaply find interesting areas for the firm to later explore with more concerted effort.

II.B Decreasing Information Costs

As the recombinant nature of innovation continues to create exponentially increasing solution spaces, accelerating technological progress leads to a dramatic decrease in information processing, storage, and communication costs (Hilbert and Lopez, 2011; Koh and Magee, 2006) to the point where many of these costs approach zero. In the microprocessor space, this phenomenon has long been identified as Moore's Law (Moore, 1965), but it can also be seen in information storage and communication capabilities (Hilbert and Lopez, 2011). These changes obsolete the classic assumption in organization and economic theory that information is expensive to process, store, and communicate (Alchian and Demsetz, 1972, Williamson, 1991). This exponential decrease in information costs has important implications. Since these costs are important constraints on the speed at which innovation recombination can occur (Altman, Nagle, and Tushman, 2015), it speeds up the recombinant innovation process discussed above.

AXIOM 2. *Rapidly decreasing information costs lead to an increase in the rate of exponential growth of the innovation solution space.*

Additionally, exponentially decreasing information costs allow firms to engage in new innovation processes utilizing new search methods. Innovation processes are often compared to Darwinian evolutionary processes incorporating variation, selection, and retention (Nelson and Winter, 1982). In this framework, at the same time that decreasing information costs speed the exponential growth of solution spaces, they also enable new search methods at all stages of the innovation process, including variation, selection, and retention. In particular, decreasing costs allow organizations to more easily engage with external communities of workers, external developers, and customers, throughout the value chain (Altman, Nagle, and Tushman, 2015). This is similar to the role that information technology plays in reducing the costs of coordination

within and across firms (Argyres, 1999).[6] For organizations in technology-heavy industries where innovation occurs rapidly and the solution space increases exponentially, engaging external communities offers the organization more effective ways to efficiently search for an optimal solution. For example, NASA has used innovation contests to solve long-standing technologically complex innovation challenges (Lifshitz-Assaf, 2017). In a very different context, General Electric has adopted open innovation techniques engaging externals communities to search for solutions to address water scarcity, the future of office lighting, and the design of a jet engine bracket.[7]

AXIOM 3. *Rapidly decreasing information costs allow firms to employ large-scale community-centric innovation approaches for searching the solution space.*

III. EXTENDING THE KNOWLEDGE-BASED VIEW

How do the large-scale community-centric innovation approaches mentioned above integrate with traditional understandings of why firms exist? We start by considering the theory surrounding Transaction Cost Economics and then discuss the more recent argument that firms exist because they are more effective at transferring knowledge than the open market, which is known as the knowledge-based view of the firm. We build upon the knowledge-based view and define the construct of the *managed ecosystem*, in which a central organization engages external communities and also maintains some degree of control over the actions of the community. In essence, we consider situations where a central orchestrating organization manages interactions of an ecosystem such that the locus of control is within the organization, while the locus of activity is outside the boundaries of the organization.

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[6] Recombinant innovation and decreasing information costs existed long before the digital economy; they are in part what gave rise to it. However, digitization has increased the speed of recombinant innovation and information costs decreasing enabling nearly costless information processing, storage, and communication. Although digitization is not the focus of this paper, it is a notable force that arose from and catalyzes recombinant innovation and decreasing information costs.

[7] https://geinnovationlab.com/10eqs/solvingscarcitythroughwaterreuse?2, accessed on April 10, 2018

III.A Transaction Cost Economics and The Knowledge-Based View of the Firm

Foundational work by Coase (1937) posited that firms exist primarily as a mechanism to internalize and reduce transaction costs. Building on this work, Chandler (1962) argued that it was beneficial for firms to vertically integrate into larger firms for greater efficiency, although this would in turn lead to the need for a class of professional managers that would organize the firm in a top-down authority-based hierarchy that would eventually come to be known as the "visible hand" (Chandler, 1977) as a juxtaposition to Smith's "invisible hand" of efficiency in the market (1776). Throughout the discourse on transaction cost economics (TCE), the make vs. buy decision point became a critical part of deciding where the activity of the firm ended and that of the market began (Walker and Weber, 1984; 1987). However, Williamson (1991) introduced a third possibility, a hybrid between make and buy where governance models such as "long-term contracting, reciprocal trading, regulation, franchising, and the like" (Williamson, 1991, p. 280) existed. In aggregate, the classic theories of the firm based on transaction cost economics lead to three governance possibilities that determine where the locus of innovation and production activity occurs, as demonstrated in Figure 2.

Building on the behavioral theory of the firm, which pointed out that information gathering and processing at the firm could be costly (March and Simon, 1958; Cyert and March, 1963), the knowledge-based view of the firm, developed as an alternative to TCE, argued that knowledge is the most valuable asset the firm possesses, and the firm is a more efficient mechanism for transferring knowledge between individuals and groups than the primary alternative, the open market (Foss, 1996; Grant, 1996; Kogut and Zander, 1992). In this view, the firm exists to generate, integrate, exchange, and apply knowledge towards productive means (Eisenhardt and Santos, 2002). Although quite different, both TCE and KBV were shown to have related predictions about make-buy decisions and empirically the two can be difficult to separate (Poppo and Zenger, 1998; Heiman and Nickerson, 2002).

As the KBV was further developed, the notion of the firm as problem-solver became an important piece of the theory (Nickerson and Zenger, 2004) allowing the focus to shift from purely knowledge transfer to knowledge generation via solution space search. With this view as background, Nickerson and Zenger (2004) introduce a new governance form that goes beyond the traditional choice of authority-based hierarchy versus open market (see Figure 2). In particular, they introduce the Consensus-Based Hierarchy as a more efficient means of knowledge transfer, and hence knowledge generation, than the traditional Authority-Based Hierarchy.[8] In Consensus-Based Hierarchy, the firm acts in a more democratic way rather than a traditional command-and-control authoritarian approach, yet still operates within the boundaries of the firm. The introduction of the Consensus-Based Hierarchy introduced a new dimension to understand the governance modes available to the firm. Further, it helped formalize the importance of trust within an organization as an increasingly important means of coordination beyond the traditional authority mechanism, as introduced by Adler (2001).

In addition to the locus of activity, the concentration of control by the firm becomes an important dimension for understanding governance (Nickerson and Zenger, 2004). Figure 3 illustrates these two dimensions and where the various governance forms reside on them. The traditional dichotomy (from Figure 2) is represented on the primary diagonal with the Authority-Based Hierarchy having an internal locus of activity and a high concentration of control and the Open Market having an external locus of activity and a low concentration of control over those activities. With the introduction of the vertical dimension of concentration of control, Nickerson and Zenger's Consensus-Based Hierarchy emerges as an important governance option in the lower-left. However, despite the utility of the knowledge-based view in general, and the problem-solving perspective in particular, these theories noticeably focus on activity that occurs either

[8] We note the similarities between Nickerson and Zenger's Consensus-Based and Authority-Based Hierarchies and the Enabling and Coercive Bureaucracies of Adler and Borys (1996). However, we used the former as our framing mechanism since it is focused on problem solving and the KBV, which are the focus of this article.

solely within the firm hierarchy or solely outside of the firm via the open market.[9] Nickerson and Zenger consider the role of control, but point out "In our context of problem solving, market governance determines the path of search by decentralizing control to those in possession of valuable, specialized knowledge. (p. 623)." Therefore, the possibility of market activities where the firm retains some degree of *centralized* control is not considered. Such activities in the upper right quadrant of Figure 3, where the firm engages with an *external* community and yet still serves a management role providing guidance, orchestration, and/or help to produce a solution to a problem are not represented in the traditional hierarchy vs. market dichotomy. We encompass these in the *managed ecosystem* construct. The following section examines the growing importance of such interactions and discusses their role in the knowledge-based view of the firm with a particular emphasis on innovation.[10]

III.B Extending the Knowledge-Based View – Managed Ecosystems

Traditional views of the firm primarily consider where the locus of activity resides as the main determinant for firm governance choices. They focus on the concepts of the Authority-Based Hierarchy, consistent with the traditional Coasian (1937) and Chandlerian (1962; 1977) views of the firm where the concentration of control is high and innovative activities occur within the boundaries of the firm versus activity that occurs in the open market. Nickerson and Zenger (2004) introduce an alternative, the Consensus-Based Hierarchy, where the locus of activity remains inside the firm, yet the concentration of control within the firm is more distributed. They

[9] Williamson's definition of a hybrid form with "long-term contracting, reciprocal trading, regulation, franchising, and the like" (Williamson, 1991, p. 280) represents a formulation including long term formal strictly contract-bound interactions between the Authority-Based Hierarchy and the Open Market, and does not address the governance method that is the focus of this paper. Likewise, Adler's (2001) emphasis on the increasing importance of trust, the coordination mechanism for communities, within the firm, or across firms in the open market, also does not include the governance mechanism in this paper. This is because Adler only considers trust within organizations or between organizations, rather than fully considering a firm managing the activities of a community.

[10] We note that although this discussion of managed ecosystems focuses on solution seeking to innovation-related problems, the governance form can apply to a much broader set of activities beyond those strictly related to innovation. This is discussed further in the Discussion section below.

argue that Authority-Based Hierarchy and the Open Market are more appropriate for searching solution spaces like that on the left of Figure 1, while Consensus-Based Hierarchy is more appropriate for searching solution spaces like that in the middle of Figure 1. However, as discussed above, the exponential expansion of the solution space that firms need to search (e.g., the solution space on the right of Figure 1) may make it difficult for the firm to search the entire space itself, even if it uses the Consensus-Based Hierarchy governance method.

We argue that the drastic reduction in information costs has led to the increasing adoption of large-scale community-centric innovation methods where the locus of activity is external (like the open market), and the concentration of control by the firm is high (like the traditional hierarchy). Figure 4 builds upon Figure 3 to graphically illustrate the gap the managed ecosystem fills when considering the two dimensions of concentration of control and locus of activity for firm governance choices.

PROPOSITION 1. *As solution spaces grow exponentially and information costs decrease, firms increasingly use Managed Ecosystems to leverage external communities while retaining a degree of centralized control.*

We use the term *managed* in defining this new concept because there is a high-degree of firm control. In the managed ecosystem governance form, the firm interacts with external communities and may search for and test innovation solutions in a manner quite different from traditional concepts of hierarchy (consensus- or authority-based) and distinct from traditional open market approaches. This includes engagement of a broad array of potential external contributors to the innovation process, leading to a process of searching the most complex solution spaces (e.g., the rightmost solution space in Figure 1) in a manner more efficient than the alternative internal governance options or the open market.

The notion of *ecosystems* in innovation is a broad one encompassing an array of business models and strategies that have emerged over the past few decades and are increasingly becoming important options for firms to efficiently search exponentially increasing solution spaces. We chose to use the term *ecosystem* as part of the governance form we are defining because

biological ecosystems have been widely adopted as a valuable analogy illustrating the interdependent nature of firms working together towards innovative solutions (Moore, 1993; Iansiti and Levien, 2004; Adner and Kapoor, 2010; Ansari, Garud, and Kumaraswamy, 2016; Hannah and Eisenhardt, 2018). Scholars study collaborative and competitive interactions among participating firms within business ecosystems (Adner, Oxley, and Silverman, 2013; Bremner, Eisenhardt, and Hannah, 2016), ecosystem governance mechanisms (Wareham, Fox, and Giner, 2014), and how firms innovate within ecosystems (Zenger and Hesterly, 1997; Boudreau, 2012). Managed ecosystems occur when a business ecosystem contains a central orchestrating organization that engages with external communities while retaining some level of control over ecosystem interactions, such as in multi-sided platform (MSP) businesses, and open and user innovation.[11] We discuss each of these further, as well as boundary conditions, in the following sections.

The managed ecosystem provides a way to manage risks associated with a pure open market approach while enabling firms to leverage advantages of engaging with a broad array of external innovators. Such a governance method does not fit the traditional "make" vs. "buy" dichotomy. In many ways, the managed ecosystem represents something like a "translucent hand" – a force in-between Smith's invisible hand of the open market (1776) and Chandler's visible hand of the firm (1977). The translucent hand of the managed ecosystem helps guide an external community to help the firm more efficiently innovate by searching an exponentially expanding solution space.

[11] Across management literature, there are many terms that refer to multi-sided platform-based businesses and related industry structures including *platform ecosystems* (Parker, Van Alstyne, and Jiang, 2017), *platform-mediated networks* (McIntyre and Srinivasan, 2017), systemic industries (Katz & Shapiro, 1985) and others. In this paper, we refer to businesses of these forms interchangeably as platforms and MSPs and in all cases mean platform businesses rather than product or technology platforms. Further, in multi-sided platform and ecosystem business models network effects usually play a defining role and are critical to ecosystem success (Afuah, 2013; Katz & Shapiro, 1994). In contrast, the managed ecosystem construct does not require network effects. It is true that in many managed ecosystems, network effects play a role in their growth and survival. But the existence, or lack thereof, of either direct or indirect network effects does not define whether or not a managed ecosystem exists.

III.C Managed Ecosystems - Examples

Having identified the gap in existing governance forms where the locus of activity is external, but the concentration of control is high, and defined the term *managed ecosystem*, we now consider examples of managed ecosystems.

MSPs (Rochet and Tirole, 2003; Parker and Van Alstyne, 2005; Hagiu and Wright, 2015a) fall within the purview of the managed ecosystem construct because they have a central orchestrating firm, and thus the network of firms they encompass does not operate as an open market. Rather they are organized as a constellation of independent entities with constraints imposed upon them by a platform manager (Evans, Hagiu, and Schmalensee, 2006; Teece, 2007) or platform leader (Gawer and Cusumano, 2002). MSPs are firms that derive much of their innovation and value from external parties, or complementors (Yoffie and Kwak, 2006: Boudreau and Jeppesen, 2015; Kapoor and Furr, 2015), so authority-based and consensus-based governance modes do not capture how they operate. MSPs are also not pure open market systems since platform managers often play a curation role of varying severity and typically serve a governance function with at least some level of rulemaking and enforcement for participants.

Apple's App Store and Google's Play Store are examples of MSPs, and managed ecosystems, where a focal firm manages a business facilitating interactions between complementors (i.e., developers) and product users (i.e., smartphone and tablet users). The MSP enables complementors to create applications that add additional value to consumers of the MSP's products (Boudreau, 2012). These MSPs vary in their governance regimes (somewhat curated in the case of Apple; mostly open in the case of Google), yet both exert a degree of control over activities within the ecosystem; they manage the ecosystem.[12]

[12] The level of curation and management can be thought of as a varying in the level of translucency of the translucent hand. Firms with high levels of involvement are closer to the visible hand of the firm, and firms that are looser are closer to the invisible hand of the market.

Micro-labor markets, a type of MSP, often referred to as constituting the gig or sharing economy, such as Uber, AirBnB, and UpWork are businesses embodying the managed ecosystem governance model. In such a setting, a firm engages a community of workers online so that firms or individuals may hire them to perform a service (Cohen and Sundararajan, 2015; Davis, 2016; Fradkin, Grewal, and Holtz, 2017; Horton and Zeckhauser. 2016). An important innovation that led to the rise in popularity of such markets was a standardized menu-based contract which greatly reduces the transaction cost of creating the contract (Williamson, 1975) between the parties on each side of the platform. Additional innovation in rating mechanisms (managed by the firm at the center of the ecosystem) help to build trust in the ecosystem.

Other managed ecosystems that fall under the MSP umbrella include social media and crowdfunding. However, in both of these contexts, not only does a focal firm (e.g., Facebook or KickStarter) use a managed ecosystem governance model, but firms that participate in the MSP must also apply managed ecosystem principles to govern their interactions with the community. For example, when a traditional media company such as a TV broadcaster uses Twitter, a social media MSP, to gather video footage from viewers during a large weather event, or any other breaking news event, that media firm is orchestrating a community of contributors through a managed ecosystem governance model. Likewise, when a startup attempts to raise funds via KickStarter, it employs a managed ecosystem governance method to inform its investors of the rules of its offerings.

The notion of managed ecosystems, however, is broader and also encompasses non-MSP-based businesses. For example, these include organizations using open and user innovation techniques to engage with external innovators (Bogers et al, 2017; Chesborough and Bogers, 2014; Felin, Lakhani, and Tushman, 2017; Gambardella and Panico, 2014; Lifshitz-Assaf, 2017; von Hippel, 1986.).[13] One example of such a managed ecosystem is General Electric's (GE's)

[13] While Chesbrough's earlier definition of open innovation (2003) was more focused on firms simply using external ideas and paths to market, which would not be considered a managed ecosystem, his later

Fuse initiative that engages innovators worldwide, and encourages them to collaborate with each other, to help GE solve significant technical challenges.[14] Crowdsourcing of ideas (Afuah and Tucci, 2012), as in the Dell Ideastorm community (Bayus, 2013), and crowdsourcing contests, where firms define a problem and allow the entire population (or a screened subset of it) to submit solutions (Boudreau, Lacetera, and Lakhani, 2011; Piezunka and Dahlander, 2015) are other types of managed ecosystem. In these cases, organizations collaborate with external communities outside their organizational boundaries and manage significant interdependencies as they coordinate the crowdsourcing process (Dahlander, Jeppesen, Piezunka, 2018). In user innovation (Franke and Shah, 2003; O'Mahony, 2003), where firms rely on lead users to help generate solutions to innovation problems, we also see managed ecosystems. Entities operating in these ecosystems are not part of an open market since they have constraints imposed upon them by a central firm. Yet, they are not part of a traditional authority or consensus-based hierarchy since they are operating within the construct of an ecosystem with interdependencies among participants. Although such users are not employed directly by the firm, and therefore have more independence than if they were, the firm helps guide their activities.

III.D Managed Ecosystems – Boundary Conditions

We now consider a variety of boundary conditions to explore concepts outside the scope of managed ecosystems that are highly related and thus may be confused with managed ecosystems. To start, we discuss strategies and governance modes clearly beyond the boundaries of the managed ecosystem construct; we then identify models that sometimes utilize managed ecosystem governance forms and sometimes do not. Traditional outsourcing to the open market does not reflect the managed ecosystem governance structure since the relationships between

definition (Chesbrough & Bogers, 2014) is broader and includes distributed innovation, which would be considered a managed ecosystems.

[14] Accessed 2/15/18: https://launchforth.io/fuse/

central firms and outsourcing partners are generally dyadic and tightly contract-bound. Suppliers' activities are highly proscribed by a central firm, governed by contractual terms, and include little uncertainty about the end-product the supplier must deliver. Risks to the central firm and the supplier are well-defined. In managed ecosystems, the third parties with which the central firm interacts is often a complementor rather than a supplier. The risks and dependencies associated with complementor relationships in managed ecosystems, like in platform ecosystems, are much less well-defined and a priori understood (Altman, 2018).

While the managed ecosystem governance form defines a type of industry ecosystem, not all such structures associated with innovation are managed ecosystems. In some cases, innovation ecosystems are de-centralized and self-organizing such as in the nascent U.S. residential solar industry (Hannah and Eisenhardt, 2018). These ecosystems are not managed ecosystems because there is no central organization coordinating activities or providing a governance or control mechanism.

Beyond these models, there are a handful of constructs that blur the lines and may sometimes manifest themselves as managed ecosystems depending on their particular governance form. For example, the commons are a set of resources that are not owned privately, but instead are held by a group of people and are governed by a set of informal or formal norms and values (Ostrom, 1990). The commons may sometimes be managed ecosystems. In the physical world, this often includes natural resources like air and water. In the digital world, it often includes the results of commons-based peer production (Benkler, 2006; Benkler and Nissenbaum, 2006) such as Wikipedia. In cases where a commons model has a controlling organization setting the rules, it is a managed ecosystem. For example, since the Wikimedia organization is at the center of Wikipedia and manages how it is developed, it is both a managed ecosystem and a commons. Meanwhile, the traditional town commons grassland is not a managed ecosystem because there is no formal organization that manages it. These two governance forms are neither mutually exclusive nor is one a subset of the other. The criteria used to define them are distinct. The

commons is defined by ownership structure (individual versus collective), while a managed ecosystem is defined by the control structure (centralized versus decentralized).

Other related concepts like collective intelligence, crowdsourcing, prediction markets, and open source software may be managed ecosystems, depending upon the context. In the physical world, a good contrast is Uber versus a physical ride-sharing bulletin board. While Uber is a large distributed ecosystem, it is controlled by a central organization and is thus a managed ecosystem. An old college ride-sharing board was self-managing and therefore not a managed ecosystem. In the open source software (OSS) world, while firms benefit by using and contributing to the creation of OSS (Athey and Ellison, 2014; Harhoff, Henkel, and von Hippel, 2003; Nagle, 2018, 2019; West and O'Mahony, 2009), OSS projects are only considered managed ecosystems when one organization controls the direction the ecosystem moves. For example, although many firms and individuals use and contribute to Linux and Apache, both have an organization at the center that sets the rules for collaboration and production, so they are managed ecosystems. Likewise, Google controls and develops the Android operating system and then releases the code as OSS at various intervals, upon which the community builds additional features which makes Android a managed ecosystem as well. However, there are also examples of OSS projects that would not be considered managed ecosystems since there is not one organization that heavily controls them. For example, FreeCAD, a widely-used OSS project that is used for 3D modeling has no formal organization managing its development, and is therefore not a managed ecosystem.

IV. HIERARCHIES TO MANAGED ECOYSYTEMS

Entrepreneurs may adopt managed ecosystem governance forms at the time of founding such as matchmakers like Uber and Airbnb (Evans and Schmalensee, 2016). Similarly, organizations that derive innovations mostly from external contributors, like Threadless the online t-shirt firm, were founded with managed ecosystem as fundamental to their business model. However, many

traditional hierarchical organizations now operate in an environment of dramatically decreasing information costs with new entrants leveraging external contributors for value creation. Thus, incumbents are increasingly motivated to transition all or part of their business models to managed ecosystems. For example, in financial software, Intuit opened its previously closed QuickBooks software allowing developers to create and offer apps to enhance it; Boehringer Ingelheim, a research-driven pharmaceutical firm, embraced a managed ecosystem model with open innovation approaches engaging directly with the scientific community.[15] In this section, we apply an institutional logics perspective (Friedland and Alford, 1991; Thornton and Ocasio, 2008; Thornton, Ocasio, and Lounsbury, 2012) to managed ecosystems. We then consider organizations transitioning to managed ecosystem governance and look phenomenologically at how innovation processes differ from those in traditional governance modes. We then identify capabilities associated with the managed ecosystem governance form and its associated logic. Recognizing that organizations often do not transition in their entirety, we also consider hybridity in governance modes and discuss challenges of dual (sometimes conflicting) logics.

IV.A. Translucent Institutional Logics

Institutional logics describe how organizations operate including describing practices, routines, beliefs, and how firms conduct business (Friedland and Alford, 1991; Thornton and Ocasio, 2008; Thornton, Ocasio, and Lounsbury, 2012). Foundational institutional theory research asserts that firm structures take the characteristics of their environments rather than of their activities (Meyer and Rowan, 1977). Newer institutional logics research reflects the increasing complexity of modern organizations and their interactions with their environment (Marquis and Lounsbury, 2007; Vasudeva, Alexander, Jones, 2015), and challenges associated with plural, blended, and

[15] See: https://openid.intuit.com/ and https://www.boehringer-ingelheim.com/research-development/open-innovation/open-innovation-boehringer-ingelheim?itid=Open%20Innovation%20at%20Boehringer%20Ingelheim

sometimes competing logics (Geng, Yoshikawa, Colpan, 2016; Lounsbury, 2007; Ramus, Vaccaro, Brusoni, 2016). Thornton, Ocasio, and Lounsbury (2012) highlight that the institutional logics perspective is "a new approach to culture, structure, and process" (p.iii). Following Thornton, Ocasio, and Lounsbury (2012), we use this perspective to better understand the managed ecosystem governance form and its impact on a firm's culture, structure, and processes, especially during times of transition.

Historically, management scholars have grouped economic activities into one of two families of institutional logics: the first includes closed, hierarchical, internally-focused logics, the second encompasses more open and decentralized organizational structures and processes. Firms utilizing managed ecosystem governance forms adopt a new type of institutional logic in between the closed and open characterizations. Extending the analogy presented earlier of the managed ecosystem governance form representing a *translucent hand*, we refer to the institutional logic used by managed ecosystems as a *translucent institutional logic*. A translucent institutional logic embodies the culture, structure, and processes of the managed ecosystem form encompassing practices, routines, beliefs, and activities that include engaging externally while retaining some control over ecosystem activities. More than just adopting an open market-type logic, organizations adopting managed ecosystems engage with, manage, and control external communities.

As noted earlier, while some organizations adopt this form from their entrepreneurial start, others begin by following more traditional Chandlerian (1962) hierarchical closed institutional logics (and may thrive with this logic for some time becoming successful incumbents), and then transition to more externally-focused, open, and highly interdependent governance modes where they exert some degree of control over the ecosystem members. In doing so, they adopt managed ecosystem governance forms and transition from closed to translucent institutional logics. In the following sections, we further expand upon how embracing translucent institutional logic manifests in managed ecosystem scenarios.

IV.B. Managed Ecosystem Capabilities

In this section, we consider capabilities that organizations must develop as they transition to managed ecosystem governance and adopt translucent institutional logics. We identify three capabilities associated with the managed ecosystem governance form and translucent institutional logic that affect culture, structure, and processes (Thornton, Ocasio, and Lounsbury, 2012): 1) shepherding communities, 2) leveraging without exploiting, and 3) sharing intellectual property.

Shepherding communities

An important characteristic of managed ecosystems is the control that orchestrating organizations exert on ecosystem members. We chose the term *shepherding* for this capability because it evokes a type of control that guides, directs, or steers rather than a more stringent control evident in more onerous contractual relationships such as vendor-supplier. As incumbent firms shift from hierarchical governance to a managed ecosystem governance form they begin to control, guide, and direct external communities to some extent. Again, they shift from Chandler's model of a *visible hand* supervising and steering internal activities, to a *translucent hand* (and the related translucent institutional logic) that provides guidance and orchestration to an external community of contributors. This shift is different than adopting a purely open model (the *invisible hand* of the market) in that the firm still provides directions, rules, processes, requirements, etc. for interactions between contributors, and between contributors and the organization. We use the plural term *communities* because often the organization embarks upon managing more than one community (e.g., managing both an app developer ecosystem and also advertisers, or managing both sellers and buyers on a platform). For example, as Ticketmaster shifted to allow fans to resell tickets on its website, Ticketmaster provided guidance (policies, etc.) not only for reselling fans but also for fans purchasing tickets from other fans. Ticketmaster created a marketplace yet maintained control over what types of transactions took place and under what conditions.

Similarly, when Amazon opened its Marketplace offering on its website, it needed to manage both third party sellers and also provide guidance/warnings to buyers.

PROPOSITION 2. *To successfully employ a managed ecosystem governance form and the related translucent institutional logic, firms develop the capability to shepherd communities.*

Leveraging without exploiting

To continue functioning sustainably over time, firms that adopt managed ecosystem governance and a translucent institutional logic need to balance providing value to ecosystem members with benefitting from those contributors while not exploiting them. In some cases, such as in MSPs like Uber, Airbnb, and Tongal central firms benefit by enabling interactions between members of the ecosystem. In other cases, such as LEGO's crowdsourcing initiative in which they gather ideas for toy sets from external innovators while continuing to serve a curating function, the central firm benefits directly from the work of a community of ecosystem members. In all cases, the central firm needs to balance benefitting from the work of external parties with the risk of exploiting them.

Often in these situations, many of the benefits are non-pecuniary because the monetary compensation for contributing is minimal or non-existent (Belenzon and Schankerman, 2015). Contributors may gain experience, feedback from other community members, status, or other benefits (Lerner and Tirole, 2002; Lakhani and von Hippel, 2003; Shah, 2006), and they need to be convinced that this is worth their effort. In a traditional hierarchical model, firms pay employees and provide direction on what they want the employees to accomplish. In the managed ecosystem form, firms are essentially *asking* contributors to participate. A challenge of effectively executing managed ecosystems via a translucent institutional logic is to ensure that not only do contributors join the community and begin contributing, but also that contributors continue to contribute because their interactions with the community (either between contributors or with the central firm) remain beneficial. In other words, in a hierarchical model, organizations operate such that if they pay employees, provide traditional benefits and an attractive workplace, etc.,

employees will perform appropriately and remain employed. In the managed ecosystem form, firms foster community engagement so the firm provides value to ecosystem members and leverages the benefits of an ecosystem without exploiting it.

An example of this is the case of Threadless, a firm built around benefitting from designs gathered by external contributors, which needs to ensure that designers continue to benefit by their participation in the community (Lakhani and Kanji, 2009). When Threadless received an offer from retailer Gap, Inc. to sell t-shirts, the firm originally turned it down in part because they were concerned about the community reaction to a decision to sell community-contributed designs to a traditional retailer and the perception that they might be exploiting community members. Another example is that early in its history, Facebook saw demand for its website in many countries but did not have resources to translate the website into all the languages of the regions where there were potential users. To address this, Facebook enabled users to do the translation work (Mesipuu, 2012). While it is possible that users could have felt exploited, in that instance, users were happy to work to gain website access in their primary language. Users opted-in to the project to contribute to the greater good and benefitted once Facebook was translated into their own language. In this case, Facebook leveraged the community resources without creating the perception that they were exploiting workers.

Scholars have previously discussed the need for firms to shift to a greater focus on enabling interactions as they engage with external communities (Altman and Tushman, 2017). The capability to *leverage without exploiting* associated with a translucent institutional logic extends that point by capturing the notion that the firm does more than just enable interactions, but also ensures that the firm, the ecosystem contributors, and the overall ecosystem, benefit from the ongoing ecosystem interactions. This extension considers activities over time and the necessity to maintain an ecosystem management role without evoking feelings of exploitation.

PROPOSITION 3. *To successfully employ a managed ecosystem governance form and the related translucent institutional logic, firms develop the capability to leverage communities without exploiting them.*

Sharing intellectual property

Firms adopting managed ecosystems and a translucent institutional logic need to adopt new approaches to intellectual property (IP) that differ from the traditional mode of creating, maintaining, and tightly controlling and licensing IP (Niculescu, Wu, and Xu, 2018). In managed ecosystems, firms adopt an IP scheme focused on broadly sharing IP. In hierarchical organizations, there are established IP management practices that revolve around protecting the firm's inventions and maintaining its ability to innovate (Pisano and Teece, 2007).

While many firms actively license IP, they often do so through complex negotiations and dyadic or multi-party contractual arrangements while still maintaining an approach of secrecy and protection. In managed ecosystems, firms adopt capabilities that more centrally involve *sharing IP* amongst community members. In all cases, when firms want to protect their innovations, they choose the appropriate means of IP protection (e.g., patenting vs. protecting trade secrets), and for patents, copyrights, and trademarks file applications, maintain IP portfolios, and defend against attack. Generally speaking, these contracts tend to contain strict restrictions on IP usage and schemes outlining how firms transfer compensation associated with the value of using the IP. As organizations adopt managed ecosystem governance forms however, they execute processes consistent with a more open and interconnected structure. In some cases, community members with whom organizations interact may expect to not only maintain a portion of the IP they create, but also to be able to license it to others themselves.

PROPOSITION 4. *To successfully employ a managed ecosystem governance form and the related institutional logic, firms develop the capability to share intellectual property with external communities.*

In Table 1, we summarize the capabilities associated with managed ecosystems and translucent institutional logics and provide illustrative organizational examples.

IV.C. Hybrid Forms: Operating as both closed and translucent

In many cases, firms undergo a process of hybridization (Battilana and Dorado, 2010, Battilana and Lee, 2014; Fosfuri, Giarratana, and Roca, 2016) whereby parts of their organizations continue to maintain traditional Chandlerian hierarchical governance modes while other parts may adopt one or more managed ecosystem governance forms. As they implement hybrid forms, they may embrace additional institutional logics (Thornton and Ocasio, 1999) either as blended hybrids with the whole organization characterized by elements of multiple logics, or as structural hybrids where organizational subsets follow different logics (Greenwood et al., 2011; Perkmann, McKelvey, and Phillips, 2019). And, as Greenwood et al. (2011) so concretely explain: "To the extent that the prescriptions and proscriptions of different logics are incompatible, or at least appear to be so, they inevitably generate challenges and tensions for organizations exposed to them." (p. 318). Organizations with hybrid governance forms, including those that in part adopt managed ecosystems, face the added tension of managing hybrid or dual (sometimes competing) institutional logics (Jay, 2013; Thornton and Ocasio, 2008; Ramus, Vaccaro, Brusoni, 2016). Dual logics may include both traditional closed logics and translucent institutional logics.

Scholars have studied similar tensions associated with managing innovation processes in the face of technological evolution, and highlighted the challenges associated with this need for organizational ambidexterity (Tushman and O'Reilly, 1996) especially as firms balance exploiting and exploring innovative modes (Andriopoulos and Lewis, 2009). In shifts to managed ecosystems employing translucent institutional logic, for example when firms embark on product to platform transitions in all or part of their organization (Altman and Tripsas, 2015; Hagiu and Altman, 2017), or move to adopt open and user innovation practices (Nagle, 2018), firms balance an internal focus while also simultaneously becoming more outward facing.

These hybrid governance forms may maintain dual innovation processes, such as solution gathering and evaluation both traditionally and through community-centric processes. Organizations may perform some solution gathering and testing internally, yet also adopt

managed ecosystems. An example is a firm creating products of its own yet also managing a community of third parties to create complementary products such as software apps. This occurs, for example, in the PC, smartphone, and tablet industries, and in videogame consoles. Examples include Intel as, to encourage demand for microprocessors, it both encouraged software developers to create complementary products while also entering some complementary markets on its own (Gawer and Henderson, 2007). Microsoft offers its Windows operating system with interfaces and developer conferences to encourage external independent software app developers, yet also internally develops and offers the very popular MS Word and Office software. Microsoft both enables and manages an external innovation community, yet also competes with community members with its own software products.

Similarly, organizations may balance traditional customer relations processes with managed ecosystem processes in a hybrid mode. For example, if users need assistance with Apple products, they can either go to an Apple Store owned and run by the firm, or consult an online crowdsourced library of solutions managed by Apple. Even in the crowdsourced forum, there are Apple employees monitoring and moderating discussions. Apple is managing the ecosystem, adopting a translucent institutional logic, while also maintaining a more traditional closed option for customer support.

As organizations balance hybrid governance modes, they similarly must balance dual (often conflicting) institutional logics. For example, rather than transitioning entirely to *shepherding communities*, a firm may maintain an internally focused hierarchical form in one part of its organization while adopting a community-centric approach in another. A classic example is Amazon maintaining both a pure reseller model while also operating its Marketplace business (Hagiu and Wright, 2015b). Both options appear next to each other on a user's screen, but they are run by different organizations within Amazon. Firms also may maintain an employee-centric monetary compensation-based approach within one part of the firm while adopting innovation contests in another part of the organization. Lifshitz-Assaf (2017) analyzes NASA's efforts in this

vein as she considers how NASA balanced maintaining internal R&D groups while also adopting open innovation processes. In this case, the organization maintained many of its traditional Chandlerian capabilities, while working to develop the capability of *leveraging without exploiting*.

Finally, as organizations use increasingly diverse and complex IP licensing with hybrid business models incorporating managed ecosystem governance, they must maintain existing IP licensing capabilities while also adopting *sharing intellectual property* capabilities in parts of their organizations. For example, within product development efforts, smartphone producers incorporate some IP that is proprietary, such as proprietary embedded software, while also including more open and accessible open source software with more flexible licensing schemes. They employ two IP licensing approaches reflecting different sets of capabilities and differing institutional logics. Firms must manage the challenges associated with adopting hybrid or dual-logic governance modes, which includes not only managing hybrid processes, but also managing dual, potentially conflicting, institutional logics.

PROPOSITION 5. *To successfully employ a managed ecosystem governance form in conjunction with also maintaining a traditional hierarchical mode, firms adopt hybrid approaches managing dual (possibly multiple) institutional logics.*

V. DISCUSSION

In this paper, we sought to extend the existing managerial concepts of TCE and KBV and present the notion of the managed ecosystem governance form where the locus of control remains within an organization, while the locus of activity is outside of it. We then use the lens of institutional logics to better understand organizations operating in this governance mode using the notion of translucency, in between a closed and open model, to represent this state. We further consider changes that occur when traditional more hierarchically-based closed organizations shift, either in whole or in part, to a translucent mode utilizing the managed ecosystem governance form. Finally, we consider specific tensions that emerge when an organization employs hybrid

governance incorporating both closed and translucent forms. Below, we discuss where these insights can be applied, and implications for organizations operating in these modes.

Managed ecosystems beyond the innovation context

Although this paper focuses in large measure on using managed ecosystems for searching solution spaces for innovation problems, the managed ecosystem governance mode is used for value creation and capture purposes much more broadly. For example, app developers creating products for use on Facebook not only create value for themselves, but also for Facebook users and for Facebook itself. While these app creators do not help Facebook search for innovation solutions, they create value for platform users and the platform by providing them with entertaining or productivity enhancing content. This keeps users on the platform longer, likely exposing them to more advertising, and increasing the value created and captured by Facebook. Examples of other managed ecosystems that engage external communities to create value include Uber and their community of drivers, AirBnB and their community of hosts, eBay and their community of sellers, and YouTube (owned by Alphabet/Google) and their community of content creators. Such communities help identify and satisfy demand through production in traditional markets like transportation and long-tail markets like entertainment and more remote travel destinations. All of these, however, are managed by a central organization while also engaging and leveraging external communities, and thus, although not focused on innovation, they embody the managed ecosystem governance form.

Partnering to manage an ecosystem

If a firm engages with another managed ecosystem provider to become a managed ecosystem, (e.g., if General Electric hires Innocentive to manage an open innovation effort) even though they are not organically creating a managed ecosystem internally, they are still adopting a new translucent institutional logic. Though they may not themselves become a managed ecosystem,

they undergo shifts associated with their engagement with, and control of, external communities. Another example arises with crowdfunding efforts. If a firm hires Kickstarter or a related site to fund an effort they adopt a translucent institutional logic as they control the community by, for example, setting funding policies and guidelines. Similar to firms that internally transition, they must be careful to leverage and not exploit, and may have to deal with issues related to sharing IP. The institutional logic perspective allows us to consider a range of changes organizations face in this transition. In contrast, if these shifts to managed ecosystems were simply contracting situations following the same governance mode, we could study them through the lens of outsourcing contracts. However, these shifts (e.g., when GE hires Innocentive, etc.) affect culture, structure, processes, etc. and thus it is appropriate to use the institutional logics perspective to understand these phenomena.

The starting state in transition (From where to where?)

It is important to understand the effects of existing institutional logics on a transitioning firm. From what state is the firm transitioning and how does that affect the transition? Existing institutional logics facilitate and/or limit successful transitions to managed ecosystems (Thornton, Ocasio, and Lounsbury, 2012). Firms that conform primarily to a hierarchical Chandlerian (1962) form, are likely to follow logics consistent with processes that are secretive, closed, proprietary, exerting significant control over employees, highly bureaucratic, requiring layers of authorizations, exhibiting slow decision making, etc. The greater the extent to which a firm follows these logics (and has been for a long time), the more likely the transition to a managed ecosystem governance form may be difficult. Conversely, firms that follow these logics to a lesser extent may find transitions to managed ecosystem governance easier. For example, firms that already significantly engage with external organizations through complex supply chain relationships and alliances, may find it easier to transition to the more open and externally focused managed ecosystem form. Firms traditionally maintaining mostly closed and proprietary

strategies may find the transition more difficult. In both cases, we expect firms to shift institutional logics as they adopt a new governance mode.

Managed ecosystem strategies maturing

We analyze incumbent firms in transition. However, even firms founded employing a managed ecosystem form may still experience shifting logics as they continue to grow as managed ecosystems and expand their engagement(s) with external communities, thus becoming increasingly more translucent. Facebook was founded as an MSP connecting users, and then later it added an additional platform side and also connected to advertisers. As it grew, it increased its translucency by opening interfaces on its service and later also allowing third-party developers to build apps to run on its platform. It continued to increasingly open its boundaries to developers and other partners loosening its control over data available on its site. Recently, it is tightening its control in some areas, as a result of regulatory and public pushback, again adjusting its level of translucency. It is evolving how it approaches managing its ecosystem. In doing so, it balances its desire to provide openness and encourage innovation with a recognition of the risks it takes, including those related to privacy rights of the user community. In the parlance of this paper, it continues to learn to shepherd a developer community in a responsible manner, and effectively manage its ecosystem.

Risks of managed ecosystem governance form

Despite all the potential benefits of using the managed ecosystem governance mode, risks may arise that do not generally impact traditional hierarchical organizations. When utilizing the managed ecosystem to create value, often the organization managing the ecosystem is blamed when something goes wrong. For example, YouTube has been found guilty of copyright infringement for content posted by users of its service and Apple is often blamed when an iPhone app stops working. Rightly or wrongly, the organization managing the ecosystem shoulders the

bulk of the negative publicity when a community member engages in suspect behavior. Therefore, when organizations are creating the rules governing the ecosystem, they must strategically decide how much control to exert and how translucent to make the relationship between the organization and the community of innovators or content producers. For example, many people say they get their news from Twitter. However, Twitter itself does not create any content. It instead relies on its user community (including individuals and traditional news outlets) to share content created by others. Although Twitter does not create this content, its algorithms play a role in what content a user sees, which is part of the way it manages the ecosystem. It takes a fairly loose approach towards censoring content (other than hate speech and pornography), but recently there have been calls for Twitter to take a heavier hand and weed out inaccurate information. However, any attempts to do so may be met with concerns about freedom of speech. These considerations highlight potential risks associated with serving as the central orchestrator of a managed ecosystem.

Leadership in managed ecosystems

As firms increasingly rely on managed ecosystem governance, the role that leadership, top management teams, and agency play may also change. In traditional Chandlerian firms, hierarchy and bureaucracy are the primary organizational structures (Chandler, 1962). Roles are strictly defined and leadership follows a command-and-control model. Remuneration is monetary and generally also includes medical and other benefits. Relationships between employees and employers may be longstanding with a paternal/maternal quality associated with them. Power resides primarily with the firm, and largely with senior managers, as they interact with individual employees, especially related to hiring and terminating decisions. Top management teams not only create policy, but also remain integrally involved with operating decisions.

In contrast, firms that adopt managed ecosystem governance may employ more participative, consensus-based, democratic organizational structures as they engage outwardly

with communities of complementors or users. The firm relies on communities for critical operational functions (innovation, quality control, etc.) and thus the community gains and exerts power. Organizational roles may be less well-defined, particularly when considering roles of contributors outside the boundaries of the firm. Organizational identity considerations become less clear as boundaries become more porous. Questions related to what the organization stands for and values may become more difficult to define and manage as significant contributions derived from non-employee actors. Further, remuneration may be still be monetary, but may also include non-monetary incentives, like status and reputation.

Non-pecuniary benefits in managed ecosystems

More broadly, non-pecuniary benefits take on immense importance in open innovation, crowdsourcing, and other managed ecosystem governance modes. Rewards of participation may encourage more intrinsic motivations. As incumbent firms adopt managed ecosystem governance forms, they may expand compensation offerings to include more non-pecuniary benefits (such as community or ecosystem certification) and provide compensation increasingly broadly to non-employee external parties. Social media platforms are generally "free" to users, but users "pay" by providing their private data that the platform then leverages to target advertising. As a result of these non-pecuniary benefits and incentives, it is often difficult to measure the economic value of the ecosystem (Greenstein and Nagle, 2014) as well as the level of effort it took to create it, which creates an interesting dilemma both for the study of managed ecosystems and their own internal valuation analyses.

VI. FUTURE RESEARCH

Although we discuss managed ecosystems in great detail, there are a number of promising avenues for future research. First, the level of translucency required to appropriately manage an ecosystem is not static. Variation in the level of control the organization exerts over the

community is likely to lead to differing outcomes, but different situations likely require different levels of control. Above, we compare the Apple App Store (where Apple exerts a high-degree of control) to the Google Play Store (where Google exerts a low-degree of control). Both are successful, but the nature of each is quite different. Future research can examine when various levels of control, or degrees of translucency, are appropriate, and what outcomes they yield.

Second, we discuss hybrid governance forms, but there are many different styles of hybrids that can be differentiated and studied more in depth. For example, different business units within a firm could operate under different governance forms (e.g., Amazon operates as a traditional retailer, but has a separate business unit that operates as a multi-sided platform, which is a managed ecosystem). It is also possible that different parts of the value chain for the same business unit may operate under different governance models. Understanding how these different types of hybrids function and when they are best used remain open questions.

Finally, although we discussed situations where organizations using traditional hierarchical governance forms engage with managed ecosystems (like when GE uses Innocentive to harness the power of the crowd for innovative ideas), there is also evidence of chains or networks of managed ecosystems. For example, Trip Advisor, which itself uses a managed ecosystem governance model partners with other travel sites like Hotels.com and Expedia, which are also managed ecosystems. Many complexities and interdependencies arise that increase both the risks and benefits to the organizations. Such interactions remain an open area for future research and will become increasingly important as more and more firms employ the managed ecosystem governance model.

VII. CONCLUSION

In this paper, we extend the KBV and TCE theories and introduce the managed ecosystem, a governance model that is increasingly being used by organizations. This form of governance sits between the traditional hierarchy and open market by having the locus of control centralized within the organization (like a hierarchy), but the locus of activity outside the boundaries of the

organization (like a market). We argue that decreasing information costs both allow for this model to be used more readily, and encourage its use due to the rapidly expanding solution space firms must search. The managed ecosystem represents a translucent hand that is between Smith's invisible hand of the market and Chandler's visible hand of the firm. Utilizing this governance model requires organizations to adopt translucent institutional logics that are a mix of the open institutional logic of markets and commons and the closed institutional logic of organizations. To do this successfully, organizations must develop the capabilities to shepherd communities, leverage them without exploiting them, and share intellectual property rights.

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FIGURES

Figure 1: Increasing complexity of solution spaces

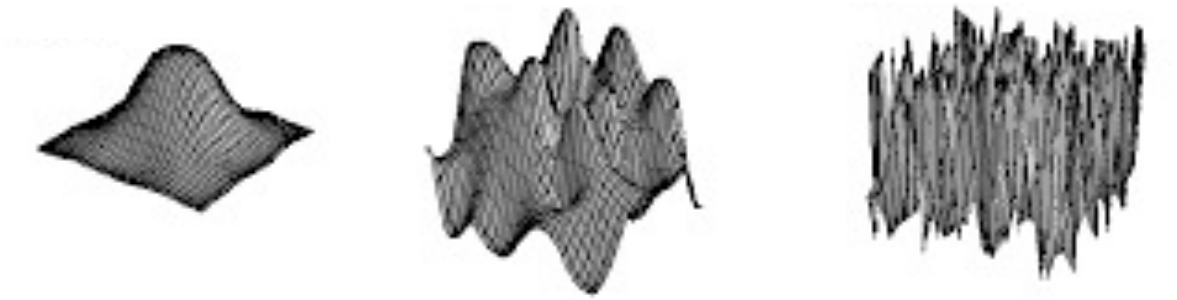

Figure 2: Locus of Activity in Transaction Cost Economics

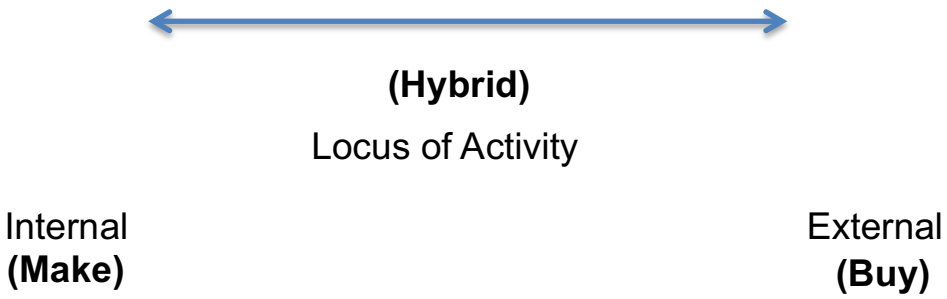

Figure 3: Concentration of Control vs. Locus of Activity

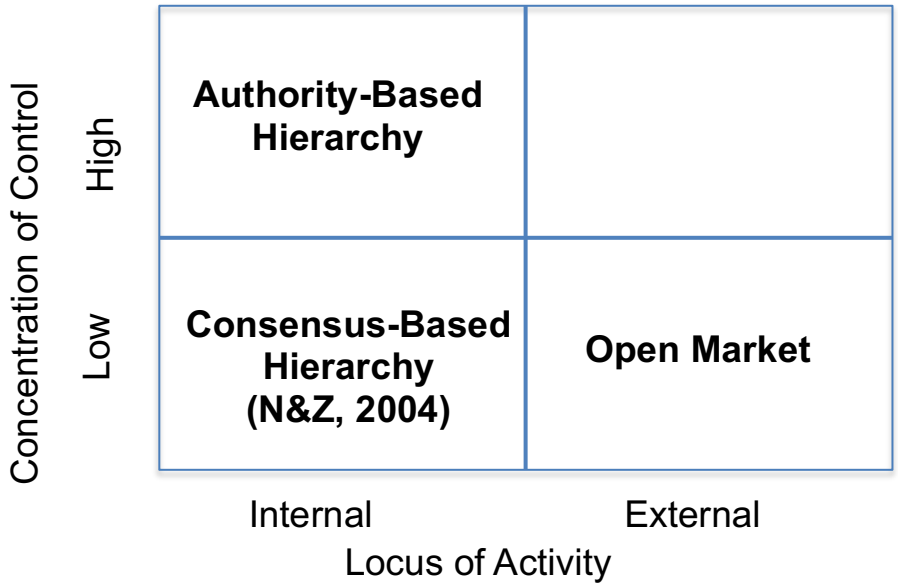

Figure 4: Managed Ecosystems in the Context of Control and Activity

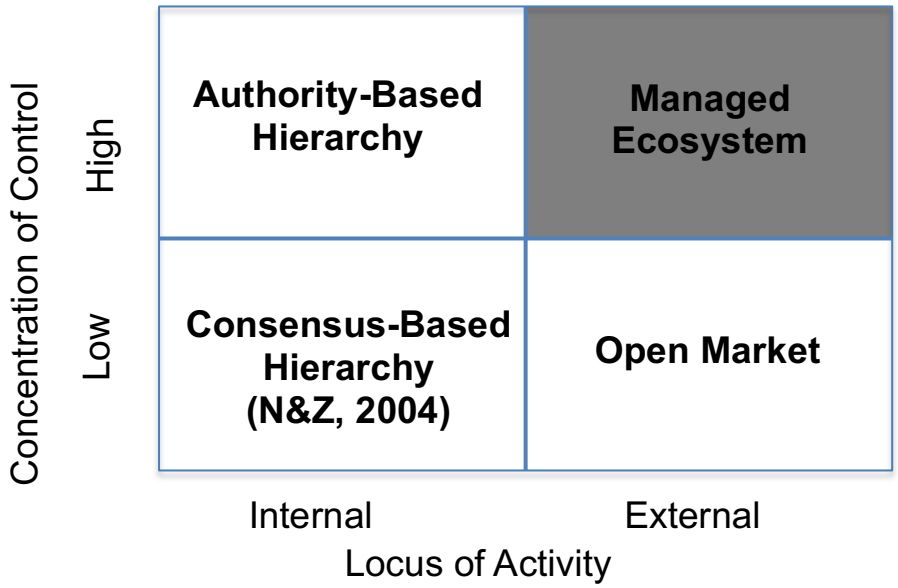

Table 1: Managed Ecosystems and Translucent Institutional Logic Capabilities

Capabilities	Capability Description	Illustrative Organizational Examples
Shepherding communities	• Exert control, guidance, direction on activities of ecosystem members. • Affect ecosystem member behaviors by providing rules, processes, requirements, etc. for interactions between contributors, and between contributors and the central organization.	• Ticketmaster providing guidance, policies, etc. to individuals and/or organizations reselling tickets on its website.[16] • Ticketmaster also providing guidance, policies, etc. to individuals and/or organizations purchasing tickets on its website.[17]
Leveraging without exploiting	• Balance providing value to the community and benefitting from activities of ecosystem members while not taking advantage of them. • Ensure community members recognize benefits they receive by contributing, especially when these are non-pecuniary.	• Threadless benefits by contributions of free designs from a community of designers. Threadless needs to ensure that designers continue to feel benefits of participating and not exploited for free labor. Benefits include feedback on their work, ability to build a portfolio, exposure of their designs, etc. • Facebook uses contributors to translate their site into non-English languages. Facebook must ensure that contributors feel like they are helping greater good and receiving benefits from work, and not just being exploited for free labor.
Sharing intellectual property	• Share intellectual property through new forms of licensing geared to open sharing and contributing. • Adopt template-based licenses ("click through") to govern IP use and sharing.	• Utilizing the very accommodating Berkeley Software Distribution (BSD) or Apache software licenses to enable wide code sharing while still retaining rights for originators and adopters to commercialize and close derivatives.

[16] See https://www.ticketmaster.com/h/sellingtickets.html?tm_link=help_nav_2_sellingtickets for Ticketmaster's guidelines for "Listing & Selling Tickets." Accessed: April 10, 2018.
[17] See http://www.ticketmaster.com/h/purchase.html for the "Ticketmaster Purchase Policy," Accessed: April 10, 2018