From Proprietary to Collective Governance: How Platform Participant Strategies Adapt

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ABSTRACT

Platform scholars tend to focus on how firms design and lead a platform that external participants leverage. Often, platform leaders govern the rules for accessing the platform and can shift these rules to maintain or improve their competitive advantage. When platform leaders alter platform rules, the strategies of external participants can be upended. Scholars have examined the trade-offs between opening and closing aspects of a platform primarily from the perspective of platform leaders, without examining how participants are affected. How do participants adapt their strategies when a platform transitions from proprietary to collective governance? Despite the fact that opening aspects of a platform are key to seeding innovative complements, little research examines this type of transition. With field data from a platform sponsor and 16 participants, we examined how participants made strategic choices that ranged in their participation intensity and trace how firms adapted these choices over time. Contributions to the platform increased as access and control opened, but most firms reduced their participation intensity when platform leadership became indeterminate. While some firms cooperated with the platform, contributing in ways that enriched the platform, other firms acted opportunistically, contributing in ways that depleted, slowed or redirected the platform’s development. Our research explains how participants guardedly learn to participate with open and collectively governed platforms in ways that both preserve and threaten their competitive advantage.

Word Count = 224
INTRODUCTION

Despite the fact that platforms depend on external participants to help create value through added extensions, applications and services that enrich a platform’s relevance (Adner, 2017; Parker, Van Alstyne, Jiang, 2016), platform scholars rarely analyze the participants that enable a platform’s propagation and competitive advantage (e.g. Jeppesen and Lakhani, 2010; Jeppesen and Frederiksen, 2006). Scholars have been primarily interested in examining how platform owners strategically achieve competitive advantage through platform leadership (Gawer and Cusamano, 2002; Iansiti and Levien, 2004). Platforms are a set of common components, interfaces or frameworks reused across a range of products (McGrath, 1995; Meyers and Lehnerd, 1997; Bresnahan and Greenstein, 1999; Baldwin and Woodard, 2009). Some platforms mediate market transactions between producers and consumers (Parker and Van Alstyne, 2005; Rochet and Tirole, 2003, 2006; Rysman, 2009; Boudreau and Jeppesen 2016), while other types of platforms help firms draw upon common components or frameworks (Boudreau 2010; Wheelwright and Clark, 1992; Gawer and Henderson, 2007) to create platform extensions.

In either case, platforms benefit from platform leaders who can optimize control over a set of governance rules to manage access and control of a platform (Parker and Van Alstyne, 2017). Even though platform leaders define the rules that govern platform participation, they often depend on communities of external participants to provide complements and extensions to enhance a platform’s utility and value (Schilling, 2009; O’Mahony and Lakhani, 2011). As a result, many platform leaders selectively open aspects of their platform to either seed the growth of producers or attract consumers that will drive adoption and usage of the platform (Eisenmann, Parker and Van Alstyne, 2009; Chesbrough, 2003; West, 2003). However, these strategic choices are not one-time decisions (Chesbrough and Appleyard, forthcoming) as platforms are rarely
static. Rather, platforms are dynamic architectures (e.g. Baldwin and Clark, 2000) evolving with the rate and pace of innovative contributions from both the platform leader and external participants. What is less recognized is that some of this dynamism also extends from transitions that platforms undertake as platform leaders adjust the rules guiding participation to manage both the growth of the platform ecosystem and their own competitive advantage.

When a platform leader adjusts a platform’s rules, they can fundamentally affect the degree to which external participants are motivated and able to access, use, modify, and recombine with a platform (Murray and O’Mahony, 2007), thus affecting the capabilities and opportunities extended to external participants. While scholars have pursued deep analysis of how platform leaders create rules to achieve their own competitive advantage (Parker and Van Alstyne, 2017; Gawer and Cusamano, 2002; Iansiti and Levien, 2004; Gawer and Henderson, 2007; Parker, Van Alstyne, and Choudary, 2016), how platform participants respond when these rules change or when platforms transition to new forms of governance is under examined.

Platform transitions can be incremental as the product of cumulative innovation (Murray and O’Mahony, 2007) or triggered by acquisitions. Transitions can change platform ownership and leadership as well as the rules governing participation, particularly when a closed platform becomes more open or vice versa. Despite the fact that prominent firms like IBM, Sun, Netscape, and more recently, Tesla, have made dramatic transitions opening formerly closed and proprietary platforms under new rules, few empirical studies of such transitions exist. Transitions can unpredictably relax certain rules and harden others which may affect external participants dependent upon the platform, leading them to re-evaluate their strategy for participation. When platform leaders change a platform’s rules, external participants must decide if their existing strategies will produce the same outcomes, as the payoff structure and opportunities available
may change as a result (e.g. Gavetti and Helfat, 2016). However, little research examines platform transitions from the perspective of external participants. How do participants adapt their strategy when a platform transitions from proprietary to collective governance?

Our research addresses this question with a seven year, inductive field study of the Eclipse development platform, examining how external participants reacted as the platform they initially engaged with transitioned from proprietary to collective governance from 2000 to 2006. By tracking how 11 specific platform governance domains in the areas of technology, architecture, legal and membership, were led, we identified four modes of governance during this time period and trace participants’ adjustments in their platform strategies. While most formal models view platform participation as a binary choice (e.g. Parker and Van Alstyne, 2005, Boudreau, 2010) we view the decision to participate with a platform as a continuous choice as the firms in our study made a range of strategic participation choices, varying in intensity, with implications for their overarching platform strategy. We conduct a dynamic analysis of the full range of strategic choices made by our sample of 16 firms to understand how their overall platform strategy adapted as the platform transitioned.

Our research reveals a rich diversity of strategies for participants ‘on the other side of the platform’ that complicates the oft made assumption that all external participants with a platform participate as complements to the platform (Boudreau, 2010; Boudreau and Jeppesen, 2016; Schilling, 2009). Rather, we found that 44% of the firms in our sample (7/16) had an opportunistic alignment with the platform, contributing in ways that could be detrimental to the platform. While these choices were immutable to changes in platform governance, participation intensity did adapted with transitions in platform governance. Most firms in our sample reduced participation intensity when access was open but platform leadership was indeterminate and
increased participation intensity only when access became managed through collective governance. By examining how participants’ platform strategies adapted to different governance conditions, we contribute a dynamic explanation of how platform participation can vary and affect a platform’s vitality.

**PLATFORM LEADERSHIP AND THE TRADE-OFFS OF OPEN GOVERNANCE**

Platforms have often been defined as a set of common components and tools (West, 2003), layered architectures (Yoo, 2010) or common interfaces (Baldwin and Woodard, 2009) that facilitate system-wide development and innovation (Boudreau, 2010). More recently, scholars have appended this definition to include a set of rules or models that govern external participation with the platform (Parker, Van Alstyne and Jiang, 2017; Tiwana, 2013). Platform leaders govern the rules for participation which regulate the affordances extended to or closed to external participation (West, 2003; Eisenmann, Parker and Van Alstyne, 2009).

In analyzing platform leadership, both practitioners and academics vigorously debate the benefits of open vs closed governance approaches (Katz and Shaprio, 1986; West, 2003; Chesbrough, Vanhaverbeke and West, 2006). By opening aspects of their platforms to external participants, platform leaders can increase adoption and relevance of the platform (West, 2003; von Hippel and von Krogh. 2003; von Hippel, 2005; Eisenmann, Parker and Van Alstyne, 2009; Boudreau, 2010; Parker and Van Alstyne, 2017). A corresponding argument is that diverse communities of external producers and consumers may be better apt to predict demand for new services, products and product features than the platform leader can on their own (Chesbrough, 2003; Seidel, Langner and Sims, 2016). Opening a platform to spur a vibrant community of external contributors can increase experimentation (Allen, 1983) and decrease the costs of
innovation (von Hippel and von Krogh, 2003; Von Hippel, 2005; Chesbrough, 2003), increasing
the value of a platform.

Alternatively, opening a platform can also provide rivals access to potentially proprietary
information (Farrell and Simcoe, 2011), increase forking and competition (Parker and Van
Alstyne, 2017) and induce uncertainty as to the future technical direction of the platform
(Greenstein, 2009). Maintaining proprietary control over a closed platform can increase profits to
the platform leader (Teece, 1986) and sustain quality standards over platform architecture and its
extensions (Baldwin and Clark, 2000; Eisenmann, 2008). Thus, platform leaders may restrict
access or close their platform to maintain the quality of participants and their contributions (Zhu
and Iansiti, 2011); decrease coordination costs (Bresnahan and Greenstein, 1999); and
orchestrate platform changes (Eisenmann, Parker, Van Alstyne, 2011).

However, these debates often neglect the fact that platforms are dynamic architectures
(e.g. Baldwin and Clark, 2000) constantly evolving through interaction with vibrant communities
of complementors and users (e.g. O’Mahony and Lakhani, 2011). To maintain competitive
advantage, platform leaders constantly manage the rules which affect the tradeoff between
opening aspects of the platform to others and maintaining control (Almirall and Casadesus-
Masanell 2010; Gaver and Cusumano 2002; Parker et al 2016). For example, Propellerhead, a
music software platform, relied on communities of developers and users to constantly evolve and
expand the scope of their own technology; eventually creating a new market for the firm
(Jeppesen and Frederiksen, 2006). As the capabilities of rival platforms shift, platform leaders
may initiate generational transitions of product features and offerings (Kapoor and Agarwal,
2017) or transition access and control of a platform (Chesbrough and Appleyard, forthcoming) to
attract, manage or influence external participation. For example, Boudreau (2010) showed that
opening access to handheld computer platforms increased the rate at which new third party devices were developed. However, devolving control, to allow third parties to modify the platform directly, had less of an effect. This suggests that opening certain governance domains of a platform can induce recombinant innovation, whereas opening other domains may not. Further, participants may vary in their responses to changes in platform access or control, when granted control, some potentially will contribute, while others may refrain.

Building on Boudreau (2010), we propose that the “rules” for platform governance embody two distinct elements: access which refers to the degree to which a platform is legally open and usable to external participants (Gawer and Cusumano, 2002; West, 2003; West and O’Mahony, 2008); and control which can be defined as the rights to set the rules which determine how a platform is organized, architected and technically produced. These two elements of governance can be managed in distinct ways and may transition differently. For example, Sun Microsystem released Java under an open source license, making Java accessible to all, including competitors such as Microsoft (Garud and Jain, Kumaraswamy, 2002), while retaining control over protocols and architecture. Netscape initially opened the code to its Mozilla browser (O’Mahony and Raj, 2006), but access and control were not opened at the same time. Netscape initially retained control over Mozilla’s development, only years later, transitioning control to an open source community who improved Mozilla and created the Firefox browser. Thus, transitions in access and control may not happen at once, but unfold over years as platform leaders and external participants grapple with how to manage governance transitions amidst changing technical trajectories.

When making decisions about access and control, platform leaders determine what to open. For example, Gawer and Henderson (2007) showed how Intel facilitated complementary
innovation by opening specific platform interfaces for markets that were important, but not-strategic, to Intel. While Intel opened access to select aspects of their platform, they maintained control over the platform’s technical direction. In a similar vein, SAP signaled to external participants the markets in which they would and would not be innovating to assure participants of their opportunities to innovate (Parker, Van Alstyne, Jiang, 2017). Platform leaders also govern who can participate (West, 2003). This not only allows the platform leader to maintain control, but creates opportunities for participants granted access. For example, while Apple’s application store is open for application developers to sell their goods, developers’ ability to join the platform is vetted by Apple. Application developers who meet Apple’s requirements not only can sell through their channel, but achieve a stamp of quality approval through admittance to the platform. Often, to create competitive advantage, platform leaders strive to figure out how to thread the needle; opening access to their platform to seed participation, but maintaining control to secure competitive advantage for themselves (Eisenmann, Parker and Van Alstyne, 2009; Gawer and Cusumano, 2002; 2008).

While many studies examine the essential role of open access in growing an external community of participants that can add value to a platform (Parker and Van Alstyne, 2017; Boudreau 2010; Gawer and Henderson, 2007), little research examines how the interests of platform leaders and external participants are navigated in platforms with open and collective forms of governance. However, an abundance of rich, empirical examples can be found in the literature on open source communities, which may be under appreciated by platform scholars. Open source platforms that are collectively governed can imbue thriving communities (Chesbourgh, Vanhaverbeke, West 2006; O’Mahony and Ferraro, 2007); spur innovation (von Hippel, 2005; Baldwin and von Hippel, 2011); and still facilitate the coordination needed for a
technically coherent architecture (Dahlander and O’Mahony, 2011). While community founded open source projects abound (Lee and Cole, 2003; von Hippel and von Krogh, 2003; Kogut and Meitu, 2001; von Krogh, Spaeth and Lakhani, 2003; Henkel, 2006; Fleming and Waguespak, 2007), the transition to an open and collective form of governance (e.g. Ostrom and Hess, 2007) can also be part of a corporate strategy (Shah, 2006; West and O’Mahony, 2008; Dahlander and Wallin, 2006). However, we know little about how such transitions happen and even less about how subsequent changes in access or control affect external participants’ strategies.

While scholars have examined how platform leaders absorb the innovations developed by external participants and communities to maintain and grow competitive advantage (Eisenmann et al, 2011; Parker and Van Alystne, 2017; Jeppesen and Frederiksen 2006; Gawer and Henderson, 2007), only recently have scholars examined platform dynamics from the perspective of the external participants that contribute to a platform’s vitality (e.g. Boudreau and Jeppesen, 2015; Altman, 2016; Kapoor and Agarwal, 2017). For example, Rietveld and Eggers, (2016) found that when platform leaders released the next generation of upgrades to their platforms, it benefited certain groups of complementing firms (top producing) more so than others, widening a disparity between high and low performing complementors. While these studies begin to untangle the interactions between platform leaders and external participants, platform dynamics are complex because relations are multi-lateral rather than dyadic (Ander, 2016; Davis, 2016).

For example, external participants can collaborate, not just with the platform leader but with each other to develop new products and applications (Kapoor and Agarwal 2017; Davis, 2016) or compete to achieve dominance in ways that may surprise either the platform leader or its competitors (Wareham, Fox and Giner, 2014; Boudreau, 2012). For example, as West and Wood’s (2013) analysis of Symbian suggests, Symbian initially controlled a common platform
and framework which handset providers, application developers, and networks depended upon.
While many external participants used Symbian as a common platform, the strategic choices made by some eroded Symbian’s leadership position over time. Thus, platform participants can vie for leadership, challenging a platform leader (Gawer, 2014; West and Wood, 2013). This phenomenon also suggests that participation with a platform is not a binary choice, as it has been typically modelled, but rather a continuous one. External participants can merely use a platform, integrate their own products with it or play leadership roles in advancing a platform’s technical trajectory. These strategic choices vary in their commitment and structural dependence on the platform (e.g. Adner, 2017), but few scholars analyze how the strategic choices that compose a firm’s platform strategy change over time. What is needed is research that examines how platform participants confront the full range of strategic choices available as platforms transition.
Our research takes a step in this direction by examining this question in the context of a platform transitioning from proprietary to collective governance.

RESEARCH METHODS

We conducted a longitudinal, inductive field study to understand how platform participants adapted their strategy with a platform as it transitioned from proprietary to collective governance. Our approach employed an embedded case design, enabling comparison of all of the strategic choices that constitute participants’ strategy for platform participation over time (Eisenhardt and Graebner, 2007; O’Mahony and Bechky, 2015). Embedded research designs are useful when analyzing multiple units of analysis, in our case, the individual and grouped strategic choices of platform participants (Yin, 1994; Davis, 2016).
**Research Setting.** Because many platform transitions have not been executed well in practice (e.g., Symbian, Java), few successful transitions are available for study. The Eclipse platform is well suited to study how platforms transition as it experienced several organizing transitions between 2000 and 2006, all of which took place in public forums providing a reliable and consistent source of data over time. Eclipse is a platform made up of modular projects built on a common set of frameworks and components that collectively constitute an integrated development environment (IDE). An IDE provides developers with unified software design space where development can occur, improving developer efficiency by reducing set-up time for different tools and enhancing coordination among developers reviewing shared code. Often IDEs consist of code compliers, interpreters, source code editors, debuggers and build automation tools which allow developers to visualize and test how their code will perform as it is developed.

Rather than mediate transitions between producers and consumers, Eclipse is a Business-to-Business platform, which facilitates complementary innovation by third parties recombining Eclipse common components. Firms can leverage Eclipse code to develop commercial products or contribute code back to the platform, although there is no requirement to do so. Initially developed as a proprietary IBM platform, over time, Eclipse transitioned to become an open source, collectively governed platform. Since its launch as an open source project in 2001\(^1\), the platform has attracted participation from a large diverse community of firms (O’Mahony, Mamas and Diaz, 2005). Eclipse can be classified as an industry platform (Gawer, 2014) as the platform is utilized by nearly 50% of all software developers worldwide\(^2\); and in 2016 over 230 firms participated in its on-going development.

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\(^1\) [https://eclipse.org/org/pr.html](https://eclipse.org/org/pr.html)  
\(^2\) [Zeroturnaround.com May 2015](https://zeroturnaround.com)
Sample Design. We constructed a theoretical rather than representative sample of 16 participating firms that joined the Eclipse community between 2000 and 2006 and also collected data from IBM and the non-profit foundation later created to manage the platform. Since our research question is about platform participants, IBM is not included in the sample as they were the original platform leader. Rather than predict which firms were likely to participate with the Eclipse platform, our intent was to understand how participants adapted their strategic choices as the platform transitioned. Thus, we selected firms that sought to participate in the Eclipse community, defined as, making at least one strategic choice to engage with Eclipse during our time of study. Table 1 presents descriptive data on the firms in our sample.

While the firms represent a theoretical sample, they also broadly mirror the population of Eclipse members during the time of study. As the size of a firm can dictate how a firm will participate in an open source community (Henkel, 2006), we compared our sample to the broader membership during the time of study. Approximately one third of the firms in our sample were small firms (annual revenue less than $10 million); one third of the firms were medium sized (annual revenue between $10 million and $1 billion); and one third of the firms were large (annual revenue over $1 billion). In the broader population of firms participating with Eclipse, approximately 43% percent were small firms and 23% percent were large at the time of study. Scholars have also demonstrated that product strategy can influence how a firm participates in an open source community or with a platform (Henkel 2006; Dahlander and Magnusson 2005). Approximately 61% percent of firms in our sample were software producers; 18.5% percent were service providers; and 18.5% percent were hardware producers. This is congruent with the
population at large at the initiation of the study. Amongst all Eclipse members, 63% were software producers, 19% were service providers and 17% were hardware producers.

**Data Collection.** To triangulate evidence for construct validity (Eisenhardt and Graebner 2007; Yin 1984), we collected several sources of field data. Data sources included the following: 1) interviews with founders of Eclipse, board members, leaders of the Eclipse Foundation, code committers and project managers; 2) observations of board meetings, committee sessions and three Eclipse conferences; and 3) archival data. While the full period of study ranged from 2000 – 2016, different types of data were available for collection at different times. Table 2 shows how this breadth of data was distributed across the time of study.

INSERT TABLE 2 HERE

(1) *Interviews.* We conducted 44 semi-structured interviews, ranging from one to three hours with the platform sponsor (IBM), foundation employees and the 16 participating firms in our sample. Where possible, we conducted multiple interviews per firm to account for variance in perspective by role (e.g., marketing managers may have a different perspective than developers). Interviews were conducted from 2004 – 2005 (40) and revisited in 2016 (4). We asked IBM, as the platform sponsor, to explain the process they pursued to divest and establish collective governance. We asked platform participants how their strategies for participating with the platform changed as it transitioned from proprietary to collective governance. All participants were guaranteed anonymity and that firms would remain unidentifiable; most interviews were recorded and transcribed (4 interview notes were written).

(2) *Observations.* Observations were conducted at board meetings, committee meetings
and at Eclipse membership conferences. To enhance triangulation, we observed interactions among participants at over 8 community events, often with the same individuals interviewed. Observations deepened our understanding of how each firm made strategic choices about their platform participation as the platform transitioned. Observations at membership meetings and conferences were conducted in two cycles, in 2004-2005 and again in 2016 when we revisited the field to understand how participation strategies changed as the platform stabilized with collective governance.

(3) Archival data. Archival data was collected from 2000 to 2016 to identify each firms’ strategic choices and confirm their timing. We reviewed 81 official board meeting minutes and related documentation; 100+ council meeting minutes and related documentation; blogs, and press releases; 11 foundation reports and 4 analyst reports. Archival data supplemented our primary data to ensure accuracy of each firm’s strategic choices as the platform transitioned. Firm product releases and project launches were also confirmed with archival data. A timeline of major platform events that occurred from 2000 to 2006 is included in Table 3.

INSERT TABLE 3 HERE

Data Analysis. We followed an iterative process, leveraging grounded theory to develop common themes and working hypotheses. Data analysis included five stages: 1) mapping changes in platform leadership domains; 2) identifying and comparing how firms’ strategic choices evolved over time; 3) analyzing participants’ participation intensity; 4) analyzing participants’ platform alignment; and 5) identifying participant platform strategies.

Stage 1: Mapping Platform Governance Domains. We began with open coding to understand how the Eclipse platform transitioned and identified 11 domains of platform
governance. For example, “designation of members and member rights” referred to the right to
determine who could be a member and the rights assigned to those members. We noted where
domains of leadership were similar and then clustered the 11 domains of leadership into four
types: *Membership* defined as control of member designation and rights; *Legal* defined as control
over IP ownership and derivative works; *Architectural* defined as control of cross-project scope
and coordination; *Technical* defined as control of project-level code development. For example,
“Designation of members and member rights” and “Designation of voting rights” both related to
the category of membership. We traced how leadership over four types of domains shifted during
our study, using interview data to pinpoint shifts and validated these with archival data. For
example, according to our informants, all “participants” were granted voting rights in 2002. This
was corroborated through press releases and board documents. Data showing how each
governance domain changed over time is provided in Table 4.

By attending to shifts at the domain level, we identified four modes of platform
governance (proprietary, sponsor, hybrid and collective) between 2000 and 2006 that permit
analysis of how participation behavior changed under different governance conditions. To
determine where phases began and ended, we looked for clear evidence of “continuity in the
activities within each period and…certain discontinuities at [their] frontiers” (Langley, 1999:
703). We defined each mode by shifts in platform leadership and definitions offered in the
literature (e.g. West & O’Mahony, 2008; O’Mahony, 2007). During the *Proprietary mode (2000-
2001)*, access was selectively granted, but mostly closed and a single platform sponsor
maintained complete control over all platform governance domains. During the *Sponsor mode
(2001-2003), access was fully open, but a single sponsor retained control of the membership architectural, and technical governance domains. During the Hybrid mode (2004-2005), access was fully open but control over architectural governance domains was indeterminate: shared with unclear boundaries between IBM and the community’s roles. During the Collective mode (2006+), access was fully open and control of all governance domains were managed by a collective. In contrast with Boudreau (2010), analysis of these four distinct modes enabled us to isolate shifts in access from shifts in control, providing a fine grain analysis of how firms make strategic choices to adapt their platform strategies under varying governance conditions. Table 5 offers supporting data from each mode.

INSERT TABLE 5 HERE

Stage 2: Defining and Coding Strategic Choices. In the second stage of analysis, we identified the full range of strategic choices firms in our sample made as the platform transitioned. We consider the choice of how to participate with a platform as a type of strategic choice or a “specific commitment to action” Mintzberg and Raisinghani (1976). Over 7 years, the 16 firms in our sample made 325 choices regarding their participation with the platform. We coded the entire set of 325 choices and iteratively refined this set to establish 10 participation choices and 2 platform alignment choices. Self-report of most strategic choices made by a firm (“Led a project”; “Became board member”) were easily validated with archival data. A few strategic choices (3 of 12) were more challenging to corroborate as archival data could not confirm whether platform participants did indeed “Sync their development schedules with Eclipse”. In these few cases, we relied on self-reported data.

Firms were coded with a “1” if they selected a strategic choice in a particular mode and a 0 if they did not. A firm might, donate code multiple times during a mode or just once. In both
cases, the firm received a “1” to indicate that they donated code during that time period. We treated each mode discretely as firms, in some cases, made a strategic choice in one mode and later reversed it. For instance, Firm 8 “Joined a project” during the sponsor mode, but ceased to do so in the hybrid mode. While some strategic choices referred to firms’ intensity of participation (Participation Intensity), our data revealed other strategic choices that referred to the degree to which a firm aligned with the goal of furthering the platform (Platform Alignment). We treated these as separate types of choices, that collectively composed a firm’s platform strategy.

Stage 3: Analyzing Participation Intensity. Rather than view platform participation as a binary strategic choice, we observed a continuous range of participation choices that required varying levels of resources and commitment. Thus, we identified a set of 10 strategic choices and ranked them with a scale from 1 to 6 to reflect participation intensity (See Table 6). Both authors independently ranked the 10 strategic choices according to the intensity of participation effort and the resources required informed by research assessing allocations of technical labor as a means to calibrate firm investment in a given technology (Tambe, 2014). Any differences in ranking were discussed until agreement was reached. Where choices were not distinguishable in participation intensity, they were scored similarly.

For example, “Use Eclipse” was ranked a 1 as anyone could download Eclipse and it required very little participation with the platform. “Joined Eclipse” was a low intensity strategic choice (ranked 2), as joining required minor participation with the platform (e.g., agreeing to

INSERT TABLE 6 HERE

For example, “Use Eclipse” was ranked a 1 as anyone could download Eclipse and it required very little participation with the platform. “Joined Eclipse” was a low intensity strategic choice (ranked 2), as joining required minor participation with the platform (e.g., agreeing to
membership terms, signing-up). From the perspective of our informants, “Becoming a board member” (ranked 3) required part-time participation. Higher intensity choices, such as “Joined a project” (ranked 4) required a firm to dedicate at least one full time developer, contribute code, share potentially novel ideas with other firms and produce code on the platform’s schedule. “Develop Committers” (ranked 5) required firms to dedicate active and contributing development resources to an Eclipse project for an extended period of time. “Led a project” was a very high intensity strategic choice (6), requiring a firm to commit multiple developers to contribute to the platform. According to our informants, leading a project cost a firm, on average, at least $1.2 million annually which equated to eight full time developers.

In ranking participation choices, we carefully distinguished between participation and contribution. Participation was defined as any strategic choice to engage with Eclipse (for example, as a user), whereas contribution was defined only as a strategic choice that included technical contributions of code to Eclipse. While all 10 of the strategic choices constituted participation, only six of these choices required technical contribution: “Donated code”, “Developed committers”, “Joined and project”, “Led a project”, “Joined multiple projects” and “Synced development schedule”. To calculate a firm’s cumulative participation intensity score for a particular point in time, we added the number of strategic choices each firm made within a phase and multiplied these choices by their participation intensity score. For example, during the hybrid phase, Firm 1 “Joined Eclipse” (score 2); “Commercialized around Eclipse” (score 3); and “Became a board member” (score 3); receiving an 8 point participation intensity score. In aggregate, any participation intensity score of 10 or above included contributions of code, whereas scores below 10 constituted participation without contribution.
**Stage 4: Analyzing Platform Alignment.** Drawing from Adner (2017: 40), we consider platform alignment as the “extent to which there is mutual agreement” among participants regarding not only their incentives and motives for platform participation, but also the configuration of their activities. In our context, this includes the nature of participants’ contributions. With our interview data, we found that firms differed in the degree to which their participation aligned with the platform’s growth. Firms with cooperative alignment participated in ways that furthered the platform’s capabilities, quality and scope. Firms with opportunistic alignment, participated in ways that could undercut the platform by slowing development, reducing code quality or redirecting the platform toward their own ends. Definitions of the strategic choices used to determine platform alignment and supporting data are found in Table 7.

**Stage 5: Identifying Participant Platform Strategies.** We identified participants’ platform strategies utilizing a configurational approach. Configurational approaches enable multiple variables to combine in a more complex manner to explain outcomes (Armanios, Eesley, Li and Eisenhardt, 2016). A firm’s platform strategy was determined by their cumulative participation intensity as well as their platform alignment. We plotted firms according to their platform alignment (Cooperative or Opportunistic) and according to their participation intensity. We repeated this mapping for all 16 firms in each phase, producing four different plots mapping participants’ platform strategies over time (Figure 1). We noticed sets of firms enacting similar combinations of strategic choices pertaining to participation and alignment. As shown in Table 7, our data revealed six platform strategies.

INSERT TABLE 7 HERE

**Observing the Platform.** required low levels of participation intensity, cooperative alignment and was defined as, participating but making no code contributions to the Eclipse
platform. *Integrating with the Platform* required mid-levels of participation intensity, cooperative alignment; and occurred when firms joined projects to ensure their existing proprietary product suite complied with Eclipse. *Expanding the platform* required high levels of participation intensity and cooperative alignment; and occurred when firms led and launched projects to develop new functionality and features in support of complementary proprietary business. *Front Running the Platform* required low levels of participation intensity and opportunistic alignment. Firms engaged in front-running offered proprietary products based on pre-release Eclipse code, without contributing code back to the Eclipse platform. *Selling-Up from the Platform* required mid-levels of participation intensity and opportunistic alignment. Firms had to contribute code to the platform to sell-up, but this code was likely to be limited or of inferior quality to existing proprietary offerings. *Redirecting the Platform* required high levels of participation intensity and opportunistic alignment. Firms had to lead a project to enact this strategy in order to redirect or reprioritize requirements based on their own interests or “hold-back” from developing features or code suggested by the community.

**FROM PROPRIETARY TO COLLECTIVE GOVERNANCE: STRATEGIC ADAPTATION TO PLATFORM TRANSITIONS**

As the Eclipse platform transitioned from proprietary to collective governance, most participants (12/16) adapted their platform strategies to increase their participation intensity. However, we found that not all participants contributing development resources and code to the platform acted in alignment with the platform, as some acted in ways that could depleted the platform. Firms with a cooperative alignment (9/16) participated in ways that accelerated the pace of development, extended the platform’s scope or improved code quality. For example, one firm launched the CDT project which ensured Eclipse could be used not just by Java developers
but also by those preferring C++, enabling Eclipse to be more broadly utilized. As firm 11 shared, “Originally it [Eclipse] wasn’t architected to be a multiple language IDE. So, now we are trying to clean it up.” On the other hand, firms with an opportunistic alignment (7/16), participated in ways that either reduced code quality, slowed the pace of development or redirected the platform toward their own ends. For example, one informant spoke guardedly about how ‘desperate firms’ might “commit, well knowing buggy code” to protect their competitive interests. Figure 1 plots firms’ participation intensity (y axis) and platform alignment (x axis) for all four governance modes.

**INSERT FIGURE 1 HERE**

As the platform transitioned, firms did not adapt their platform alignment. Firms with cooperative alignment consistently participated in ways that aligned with the platform’s growth, while firms with opportunistic alignment consistently participated in ways that could inhibit platform growth. However, most firms (regardless of platform alignment) adapted their participation strategies as access and control changed. We trace how firms that were either cooperatively or opportunistically aligned with the platform adapted by phase in order to understand both collective changes in platform participation as well as how participation varied.

**Platform Transitions: Four Modes of Governance**

**Mode 1: Proprietary (2000 – 2001).** Initially, Eclipse was controlled by IBM alone. Access to the development process was closed and the code was proprietary (see Table 4). To both seed adoption and economically build the “best IDE,” IBM contracted through an NDA with select partners to use and test “Eclipse” under closed access and control conditions. As Firm 8 shared, “IBM lawyers wouldn’t let them [meet] without us signing off on all these forms. So,
we signed off.” Three firms were granted access to the platform source code as “test users”. Even though this code was not licensed under open source terms, all three firms previewed the source code, were given limited usage rights and began developing extensions of their own products based on what they learned.

**Cooperative Alignment.** One firm (9), noted that options in the market for IDEs were less than satisfactory. “Too technically limited”, “too expensive”, and “too costly” to build on their own, firm 9 seized the opportunity to use Eclipse, which promised a “write once, run everywhere” solution in the market. Our informant shared, “IBM showed us a lot of the work they were doing in Eclipse before it was open source. And suggested it would be really cool if we did some of our stuff based on their platform, Eclipse.” Firm 9 reviewed the code to learn how their existing offerings could complement Eclipse: “We saw Eclipse as a platform. We started to investigate it, and we thought ok, we build this one small product on Eclipse.” They observed the code to learn how best to “effectively get their existing technology to operate with Eclipse”. By merely *Observing* the way Eclipse worked, firm 9 created a derivative product to entice new Eclipse customers. “People began to notice, this is actually pretty cool, this is really working well with Eclipse… the product actually became a very big product.”

**Opportunistic Alignment.** Two other firms started immediately engaging with the platform to *Front run* it by building competitive products based on Eclipse’s piloted code. Firm 8 considered early access to Eclipse as a source of competitive advantage:

> “You couldn’t really get inside. We had access to the source code through our contract. With our access, we could take our [commercial, proprietary browser] functionality and integrate it in so deeply that it just added itself into the menus. Because we got in so deeply no one knew we were there. It was like we were trying to sell our product, and well look, it’s already in here.”
Firm 8 was able to front run Eclipse with its own commercial product when it launched before Eclipse was opened to others. Users that downloaded Eclipse were prompted to download Firm 8’s commercial code which offered enhanced functionality to what was available in Eclipse for free. Firm 8 hoped to leverage Eclipse users, but direct them to their enhanced proprietary offerings even though access and control of the platform was still governed by IBM.

Unsurprisingly when access was mostly closed and all governance domains closely guarded by IBM, firms were limited in how intensely they could participate with the platform. Thus, all firms participated only by either Observing or Front Running the platform (Table 7 provides additional examples).

Inviting external participants to pilot and test Eclipse clarified three challenges for IBM which motivated a transition from proprietary to open access. First, IBM needed outside talent to robustly build “best in class technology”. Second, the cost to extend Eclipse was significant with minimal expected return due to low margins in software tools. Third, there was some urgency to develop Eclipse quickly to compete with Microsoft and Sun (see O’Mahony, Mamas and Diaz, 2005 for more detail on IBM’s rationale). To increase adoption of the platform, IBM Directors decided, in early 2001, “that in order to build momentum on this [Eclipse] and to get more vendors to build their products on top of it, we had to make it open source. Otherwise they [participants] would not take the risk of building on a proprietary platform.” Platform participants recognized that this transition was more strategic than charitable: “You could argue that Eclipse was IBM’s way of burning down the market for Sun. And maybe a little bit for Microsoft.” IBM hoped that by providing a robust platform, they could attract others to their proprietary middleware stack and away from competitive offerings.
Mode 2: Sponsor (2001 – 2003). In the sponsor mode, access to the platform’s code and development process opened to the public, but the platform continued to be led by IBM. Any firm or individual could use Eclipse or contribute to the platform under the terms of a common public license (CPL). As shown in Table 4, IBM transitioned 3/11 platform governance domains to a consortium of invited firms to collectively manage access.

However, IBM remained the platform leader by retaining control over all architectural domains (3/3); membership domains (2/2) and technical domains (3/3). For example, voting rights over the platform’s future direction were “on-paper, shared evenly across members” as each firm had a single board-level vote. However, voting rights were not clearly delineated at other levels of decision making (e.g., at the project-level). For example, if an individual was present at a project-level meeting, he or she had the right to vote on any matters raised. A firm with five individuals joining a project meeting had five times more votes than a firm with one individual attending the meeting. Because IBM always had multiple individuals at any meeting and most other firms only sent one representative, IBM was typically in control of the outcomes of group voting despite extensive efforts to convey openness to a growing community of firms.

As firm 13 remarked, “IBM walked around looking for columns to hide behind so that nobody would notice that they were there. It was a very aggressive neutral posture because they were trying to create the perception that they weren’t in control, and that they weren’t dominating, and so even though they were, you know how it is? It’s all Open Source. But you control 80 of the 82 guys that are developing it.

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3 The license gave firms the right to own their code, and derivative works built off of code found within Eclipse. The CPL named IBM the steward of the license. Some firms (2 of 16) legally viewed this as an issue, and later the foundation was named as the legal steward. However, most firms (14/16) did not view the license as a barrier to participation.
Thus, even though Eclipse was publically accessible, IBM maintained platform leadership. Yet, under these conditions, 58% of firms in our sample (7/12)\(^4\), joined projects and contributed their IP, ideas, and resources.

**Cooperative Alignment.** Seven firms cooperatively aligned with the platform during the sponsor mode. In general, firms with cooperative alignment enacted two types of strategies varying in participation intensity. Three firms (4, 5, 14), sat back, *Observing* the platform: joining Eclipse, using Eclipse and participating as board members. While sharing a belief that Eclipse had potential, firms 4, 5 and 14 were unwilling to “commit” development resources to an open source project still led by IBM. As firm 5 shared, “We had a fundamental problem with the fact that it looked to be owned and driven by IBM. From day one our discussions were around how to open up. In a similar vein, “You couldn’t commit it [code] back in unless you were a committer, and that was managed by an IBM project leader”.

From the perspective of informants at these three firms, contributing code could provide competitive advantage to IBM and others in the community at their expense. As put by firm 4, “All of the committers were IBM. All of the requirements were IBM. All of the management was IBM. So, there was both the perception and reality that it was an IBM Trojan horse”. Because IBM effectively led the platform through its sheer numbers of contributing developers, participants worried that code contributions could be appropriated with little prospect of censure. Participants observing the platform were also concerned that contributing code could provide their direct competitors (also participating with the platform) an advantage. An informant shared his firm’s concerns: “Why the hell would we contribute? So that Oracle\(^5\) could turn around and

\(^4\) 12 firms in our sample joined Eclipse during the sponsor phase  
\(^5\) Oracle joined the Eclipse community in 2002
produce our stuff?” These firms wondered what prevented participating competitors with equal access to Eclipse from misappropriating their code contributions?

In contrast, firms 9, 10, 11 and 7 were cooperatively aligned with the platform but enacted strategies that required more intense levels of participation. Firms 9, 10, 11 Integrated with the platform and firm 7 attempted to Expand (see Table 7 for more details), the scope of Eclipse and was the only firm to lead a project (see Figure 1). These firms bet on Eclipse emerging as an industry platform and saw how they could gain. As one firm shared, “it will be a Coke and Pepsi world,” in the software tools market and they benefited from this market consolidation. All of these firms produced products that required integration at some level with an IDE. If there were 15 IDEs on the market, they had to re-calibrate their products for all 15, incurring significant development costs. If only one or two IDEs existed, maintaining interoperability reduced costs. As Firm 11 explained, “With Firm [x] moving off of their IDE and standardizing on Eclipse, that frees us a developer.” Under open access but sponsor controlled conditions, firms 9, 10 and 11 contributed resources to integrate Eclipse into existing product suites or expand the platform. As shared by firm 9: “good developers require more than just the work in progress code.” By joining projects, these firms were invited to attended development meetings, refine working code, review planning documents and evaluate specs. Contributing code and technical resources gave firms with cooperative alignment intimate knowledge of how best to integrate with Eclipse and helped further Eclipse’s growth. In this way platform and participant interests were aligned.

**Opportunistic Alignment.** Five firms (8, 12, 13, 15, 16) participated by either *Front-running the Platform* or *Selling-up from the Platform* (see Table 7 and Figure 1). Firms 15, 16 participated by *Front-running* the platform to offer proprietary, competitive products such as debuggers, based explicitly on pre-release Eclipse code, without contributing code back to the
community. Pre-release code is unfinished or uncommitted code found in an open source community prior to its official release. As one firm shared, “What we’ll do is if we want to go into a particular product area, we’ll go look at Eclipse. When we find some code with reasonable quality that gets us 50-percent of the way there, or 60 or 70 whatever it happens to be. We’ll take that technology.” As one informant explained, these firms were taking code from Eclipse and “running in front” to launch proprietary, commercial products before they could be included in the platform’s open source release. By launching first, these firms could attract users but also trigger confusion as to code provenance, which would require work to be clarified by IBM before a release.

Three firms (8, 12, 13) participated by joining projects to explicitly contribute code as part of a Selling-Up strategy. These firms contributed code that was limited or inferior to their own proprietary offerings to generate sales leads and differentiate their commercial products. One firm described, “Some of my technology I’ll open source. I make sure that my cool stuff will then be proprietary.” The thrust of this strategy was to leverage participation in Eclipse by informing those who downloaded or used Eclipse that more advanced, proprietary software was available for purchase. As one firm shared, “We try to become the committers for Eclipse. That means we can purposely make sure that our proprietary product is wonderful and better than the open source version.” Contributing inferior code to the platform could degrade platform quality and slow platform growth as users were less likely to adopt Eclipse if better commercial alternatives existed. Opportunistic behavior advantaged participating firms, but could be detrimental to the platform and the community.

Neither the consortia of firms or IBM penalized firms participating opportunistically. “You are never going to get your competitors to play by your set of rules. And if you are Open
Source … if your objective is to get an open playing field for the infrastructure then you have to enable your competitors as well as yourself” (Platform Director, IBM). Firms that were opportunistically aligned innovated with derivative products on top of the platform. Some of their new products were popular with users, others were not. By tracking the success of these derivative products, IBM and the broader Eclipse community could gauge demand for features and offerings that could later be absorbed into the Eclipse platform. For example, as firm 8, shared, we are “the market leading Java GUI designer. Eclipse has a rudimentary one… We know that Eclipse is going to look at what we do and eat this product from the bottom.” Eclipse members observed which commercial innovations did well and, in turn, replicated and absorbed them into Eclipse (e.g. Gawer and Henderson, 2007; Eisenmann et al, 2011). For some firms, IBM’s retention of most platform governance domains inhibited taking on leadership roles. While open access attracted participation from most firms, and code contributions from more than half, as shown in Figure 1, only a few took on leadership roles.

**Mode 3: Hybrid (2004-2005).** In the hybrid mode, IBM legally transitioned governance to a non-profit, independent foundation staffed by full time employees with the oversight of a board representative of Eclipse members. However, multiple firms found that the board and foundation’s role in directing these domains (e.g. establishing new project processes, setting the future scope of Eclipse and coordinating across projects within the platform) to be unclear. No other firm stepped in to replace IBM in the role of a platform leader, creating a leadership vacuum. As firm 5 expressed, “It [leading the platform] requires an enormous amount of resources and energy. They [IBM] have got their own things to focus on. IBM made the decision to pull back in 2003, and here we are in the beginning of 2005 and there are still quite a few things that aren’t completely done”. One firm explained the general confusion: “There was
confusion as to what Eclipse really was – an IBM project? An open source project? A standards like consortium? Many companies were reluctant to make a strategic commitment to build product on Eclipse”. IBM appeared to be relaxing its leadership over the platform, but it was not clear how collective governance was going to work in its stead.

**Cooperative Alignment.** Firms with cooperative alignment (3,4,5,6,9,10,11,14) limited their participation to *Observing* the platform, participating only as members of the community, the board, and commercializing products based on Eclipse without making code contributions (only firm 7 continued to lead a project). With platform leadership uncertainty, even the 3 firms who had started to commit development resources to the platform and were *Integrating* with the platform began to pull back. Firm 9 recommended that the new foundation, “bring in facilitation help.” Or, as an informant from firm 5 explained, “We had a lot of trouble coming up with how are we going to coordinate across ourselves”. While firms were no longer worried about IBM’s role, firms interested in expanding the platform struggled with how to do so, because the process to launch new projects was not well specified. As firm 3 shared, this introduced a degree of risk when proposing a new idea:

> There was a possibility that we would propose this [new project], get it shut down, and then all of the competitors in the market would know that we’ve got this strategy, but we’ve failed. To be honest one of the biggest challenges that I had in convincing people internally was that anybody could join Eclipse, but could I get the project through and actually launch without having things derailed?

Without clear process guidelines to manage the initiation of new projects, firms were hesitant to invest their time and resources and pulled back, observing if and how a workable collective governance structure would unfold.
Opportunistic Alignment. All seven firms in our sample, with an opportunistic alignment (1,2,8,12,13,15,16) limited their participation with the platform. With open access and indeterminate control, any firm with committer rights could ‘dump’ code into the platform without a clear review process and potentially wreck havoc with other firms’ source of competitive differentiation. This happened to firm 8 when a member firm introduced code in to Eclipse in an area firm 8 had hoped to commercialize:

We said if you guys are going to put [it] in Eclipse, we don’t want to be there, but nobody was doing [x]. So, we invested for a year and a half and we created this incredible technology and product. About the time we get it done, we start to hear these little rumors... you and all of your minions told us that you weren’t going to do anything in this field, and now we hear this is coming out from your guys?

Ultimately firm 8 introduced their proprietary product only to discover that after a year and a half’s worth of work, this functionality was now included in Eclipse and freely available.

It was totally proprietary. It was ours. They didn’t steal our code, don’t get me wrong. I’m not accusing them of doing anything illegal. It’s not illegal to look at someone’s product and the details of it, and replicate it. That’s not illegal at all. It’s illegal if you steal it. They stole our ideas which flattered us, but pissed us off. They told us they wouldn’t.

Firm 8 felt that their product was now “…worthless commercially. I mean it wasn’t totally worthless, we did sell a little. But we started getting customer questions like ‘hey I just found all of your stuff in Eclipse.” While unplanned contributions helped grow the platform’s capabilities, it could also commoditize a participant’s competitive advantage relative to the platform. As an informant from firm 13 shared, “Eclipse competes with every commercial thing on top of it. That is really the issue, and if it grows too quickly, it wipes out those commercial interests… I don’t mind competing with [firm x] with our tools or [firm y], or anyone else, the competition is fair. But you can’t compete with your own platform.” The success of the platform created a growing threat for firms that depended on commercializing the extensions they created on top of the
platform. Firm 8 was so distraught that they reduced their participation intensity and considered leaving the community.

In the hybrid mode, both access and control was opened to platform participants who became members of the foundation, but platform leadership was indeterminate even to those closest to Eclipse. Legal divesture from IBM to the foundation had been successful, but there were open questions as to how decision making would take place. With reduced concern over IBM’s control over platform governance domains, scholars might expect firms to contend for platform leadership (e.g. Parker et al, 2016; Gawer and Cusumano 2002), yet, no firms in our sample did so. Rather, participation intensity moved in the opposite direction as all firms (except firm 7) reduced their participation. Firms with a cooperative alignment were concerned about their ability to control their investment in a collectively governed platform when they could not predict the development trajectory. Firms with an opportunistic alignment were nervous about their ability to create commercially differentiated products under a free-wheeling structure where their ideas could be rapidly commoditized or appropriated by others.

Mode 4: Collective (2006+). Eclipse transitioned to a full collective governance mode when a representative board of equal participants assumed control over all membership, legal, architectural and technical platform leadership domains (as shown in Table 5). A major shift occurred when the foundation led the collective design of key processes to guide participant contributions to the platform. First, they developed a road-mapping process, outlining a clear direction for every project, at the approval by the board. Those leading projects had to work within the bounds of the approved scope and could not drop in unexpected code at any time. This process outlined review and comment periods before new projects could be approved, providing firms with temporal predictability so they could adapt their commercial strategies in response. As
firm 13 explained, “projects will be reviewed for a certain time so they won’t show up overnight,” creating both an exclusivity period and room for adaption. Second, they introduced “release train,” a coordinated release of Eclipse projects 4-6 times per year that would help platform participants coordinate their development timetables with Eclipse and make integration with commercial products more predictable. Firms could no longer release Eclipse project code independently without agreement and coordination with the broader community (as had been done in the Sponsor mode). Under this mode of governance, participation intensity increased with 56% of firms now contributing development resources, a significant recovery from the depressed contributions apparent in the hybrid mode. Further, many firms contributed by taking on new project leadership roles.

Cooperative Alignment. Nine firms with a cooperative alignment participated by either observing the platform or by expanding it. None of the firms enacted an integrating strategy during this phase. Firms either intensified their participation by leading projects or participated without contributing code. Six firms (3,4,5,6,7,9) with a cooperative alignment expanded the platform by contributing significantly as board directors engaged on architectural domains of governance and by joining multiple projects, leading projects and even syncing their internal development schedules with Eclipse’s release train. According to our informants, creating a collective governance structure motivated firms to increase their participation intensity and take on project leadership roles. As Firm 6 explained, “there were two things [of concern], one was just how much IBM people ran Eclipse and the other was the governance model. Who got to decide on what? So, when they moved to this model where IBM is like any other member company. I think that was one key point.” With the creation of collective governance, many


firms now deepened their participation, contributing more code and resources to the platform, distributing platform leadership across a diverse set of hardware, service and software firms.

Opportunistic Alignment. Firms with an opportunistic alignment participated mainly at two extremes: either by *Front-running the platform* or by *Redirecting the platform* (see Table 7 and Figure 1). Firms 12, 13, 15 and 16 explained that, with the creation of the roadmap, board membership provided adequate visibility and influence over the pace and direction of Eclipse without contributing code as they had during the sponsor phase. Now armed with visibility as to the technical direction of Eclipse six months out, firm 13 had the opportunity to influence the platform’s pace without becoming directly involved in a project. Firm 13 explained how the roadmap and process for evaluating new projects helped his firm adapt to platform growth:

I need visibility six months out. I can’t be commoditized tomorrow. If you give me six-months, then I can adapt. That was a kind of compromise. The projects will be reviewed for a certain amount of time and won’t appear over-night… That is really one of the big differences between Eclipse the way it is now vs. the way it was.

Board members also had the right to approve the charters and roadmaps for each project, with power to veto, by majority, if a project seemed “out of accordance with the purpose and scope of Eclipse”, per firm 15. These governance rules provided value to platform participants as they now had access to more information and more ability to influence the platform’s direction and growth than in the prior phase and could do so without committing development resources.

Two firms with opportunistic alignment (1, 8) not only participated as board members, but also joined multiple projects, led projects, and synced their development schedule to align with Eclipse. Project leadership afforded firms with an opportunistic alignment the chance to influence a project and *Redirect* it towards their own competitive interests. As Firm 1 explained “So, then it was the question, do you want to build on Eclipse and not have any influence on the dependency you are taking? And also not be seen as a leader, but a follower in the space? Or do
you want to jump in and lead? Well, you’d jump in and lead.” While a firm might not be able to
dramatically shift a project’s scope with the roadmapping process in place, project leaders had,
as explained by firm 7, “negative authority” or veto rights. That is, project leaders could redirect
projects by shaping development priorities or by omitting bug fixes that would enhance the
platform relative to proprietary products. This type of behavior could be depletive to the
community as failing to commit bug fixes offered by users not only devalued code quality, but
could discourage community members from sharing their ideas. In this manner, firms with an
opportunistic alignment assumed project leadership roles primarily to maintain competitive
differentiation from the platform.

**Understanding Participant Variation.** By tracing participants’ strategic choices, we
pinpointed critical micro-moves that provide new insight on platform strategies which would be
missed if platform participation was measured as a binary choice. Technically, all firms in our
sample participated in Eclipse, but participation intensity turned out to be highly variable under
different modes of governance for most firms. In the proprietary mode, when both access and
governance was closed, very few firms participated (in both cooperative and opportunistic ways)
but none contributed code. In the sponsored mode, when access was open but governance was
closed, more firms deepened their participation by contributing development resources. In the
hybrid mode, when access was open, but governance over platform leadership was
indeterminate, those firms that had deepened their participation now pulled back and disengaged.
In the collective mode, most firms reengaged to not only deepen their participation but also
assume new platform leadership roles, surpassing the engagement in the sponsored mode. Thus,
external participation was highest under conditions of open access and collective governance and
lowest under conditions of closed access and proprietary control. In sum, firm contributions to
the platform continuously increased as access and control opened to the collective and produced
distributed platform leadership, but most firms reduced their participation intensity when
platform leadership became indeterminate, even under conditions of open access.

Without fine grained analysis of how firms participated, we would also miss identifying
variation in platform alignment. Not all types of contributions necessarily aligned with the
platform’s growth. While some firms cooperated with the platform, contributing in ways that
enriched the platform’s expansion, other firms acted opportunistically, contributing in ways that
could deplete, slow or redirect the platform’s development. These observed variations remained
stable across all four modes of governance. To better understand these differences, we revisited
the data and compared attributes of firms with cooperative versus an opportunistic alignment.
Firms with an opportunistic alignment were more likely to maintain business models in the
software tools industry that directly competed with Eclipse’s offering and these firms
participated with the platform regardless of the mode of governance. Firms with a cooperative
alignment were more likely to include a diverse set of sub-industries that complemented the
platform (See Table 7). Thus, we propose that platform participants operating in industries more
competitive to a platform, will, under conditions of openness and access, increase their
participation intensity and contribute development resources, but these contributions may further
their own competitive interests in ways that can be depletive of the platform.

DISCUSSION

While many scholars have argued that platform leadership is a critical source of
competitive advantage, the focus is often on the strategies of the platform owner or focal firm
rather than on the strategies of those firms participating with the platform (Gawer and Cusumano, 2002, 2008; Van Alystne et al, 2016; Adner and Kapoor, 2010; Adner 2016; Kapoor, 2013; West and Wood, 2013). How platform participants craft strategies to create value from the other side of the platform is an equally interesting avenue for exploration - particularly because the success of any innovation participants create will also affect the success of the platform (Adner, 2012, 2017). Firms innovating from the other side of the platform embed their futures with the platform (Adner and Kapoor, 2010), yet, these firms typically have little control over the platform’s trajectory.

Although most scholars acknowledge that platforms are dynamic, little empirical research has examined platform transitions from either the perspective of the platform leader or platform participants. This is an underexplored opportunity as platform transitions offer a clear window into platform dynamics. For, it is these moments, when a platform’s rules guiding participation are most likely to be revised, that can trigger platform leaders and participants alike to reevaluate their strategy. In our case, the transition did not happen overnight, but rather access and control were gradually opened to collective control. This phased transition enabled the examination of firm behavior under four different modes of governance, lending insight and precision to different access and control conditions that can impede or foster the intensity of participation, a key variable of concern for scholars for open innovation (Fleming and Waguespack, 2007; Boudreau, 2010; Boudreau and Jeppesen, 2015, Kane and Ransbotham, 2016, Dahlander & O’Mahony, 2011); Dahlander and Gann 2010; Jeppesen and Frederiksen, 2006).

Taking advantage of these varying conditions, we identified four types of domains (membership, legal, architectural and technical control) guiding access to and control over the platform and trace how these domains gradually opened to collective control. Prior platform
scholarship has focused on a single decision to grant others access to a platform at a specific point in time (West, 2003; Boudreau 2010). Yet, access to a platform concerns only a limited aspect of governance that platform leaders can leverage to seed platform adoption. We consider how a more expansive set of governance domains influence participants’ ability and willingness to participate which offers additional levers to designers of platform ecosystems. Rather than view participation with a platform as a binary strategic choice, our fine-grained data enabled us to identify a continuum of strategic choices that varied in participation intensity which helped reveal shifting patterns over time. With a longitudinal, multi-method field study, we show how 16 participants adapted their strategies under four different modes of platform governance. In doing so, we specify not only how varying governance conditions affect platform participation, but also identify an underappreciated source of variation in the nature of participation on the other side of the platform. While much existing research assumes that only complementing firms are likely to participate with platforms, we identify two distinct types of participants based on the nature of their platform alignment. Both discoveries contribute to the literatures on open innovation and platform governance.

*The relationship between governance conditions and platform participation.* Prior research has focused on how technological change (Hargrave and Van de Ven, 2006; Rosenkopf and Tushman 1998) can upend a community or platform (Chesbrough and Appleyard 2017 forthcoming) without appreciating the degree to which changes in governance can also affect platform dynamics. We have shown how governing access and control can differ and how these two elements can be amended independently. Access affects the degree to which external platform participants can build on the platform and innovate cumulatively, whereas control over decision rights affects the participation incentives and rewards available to others (e.g., Boudreau
2010). Both have implications for participants’ platform strategies. Although scholars recognize that platforms have dynamic architectures (Baldwin and Woodard, 2009), little empirical research has examined how transitions that alter access and control affect platform participants. Our research shows that changes in a platform’s access and control can affect the participation intensity of firms engaging with a platform although not necessarily in the expected direction.

While scholars of open innovation might expect a community to thrive under conditions of open access and collective control (Shah, 2006; West and O’Mahony, 2008), platform scholars might expect competitors to rush in and compete for leadership roles once an incumbent platform leader divests control (Gawer and Henderson, 2007; Parker, Van Alstyne, and Choudary, 2016; Parker and Van Alystne, 2017). Rather, we found that under conditions of open access and control, most participants reduced the intensity of their participation when clear platform leadership was not in place. Once governance was managed by collective control, most firms re-newed their contributions, although a few did not. Platform participants were willing to contribute code under conditions of open access and sponsor platform leadership, but only willing to invest in leading projects when access and control became collectively managed by a pluralistic community. Much like any standard setting organization (Farrell and Simcoe, 2012) or collectively managed resource (Ostrom, 1990), agreed upon process controls were critical to both the establishment of collective control and the revitalization of platform participation.

We recognize that our focus is on changes internal to the platform and that there are other relevant variables external to the platform not measured in this study that can affect participants’ platform strategies. There is no way to confirm a causal relationship between changes in access and control and the observed participation outcomes. Based on the temporal ordering of platform changes and participant responses it is plausible. All firms in our sample were subject to
common conditions in the software industry. If there was consolidation in the software tools industry, we might see a linear increase in platform participation as other platform options were retired. Yet, our informants reported substantive reductions in participation during the hybrid phase in response to governance concerns followed by a significant recovery once collective governance was established. Relying on the data available and abductive reasoning (Locke, Golden-Biddle and Feldman, 2008), we have reasonable confidence to suggest that the conditions of open access and indeterminate platform leadership depressed participation and that conditions of open access and collective governance increased participation intensity.

Thus, the conditions of openness alone may be inadequate to stimulate platform participation and the ability to influence platform leadership may be a critical antecedent to external strategic investment from other firms. Participation intensity is a key factor explaining the logic underlying theories that champion open innovation (Chesbrough, 2005). It is the diversity and frequency; constancy and vitality of contributions that enrich what external innovation systems can offer (Raymond, 1999). Thus, changing the rules which manage access and governance of any system purporting to support open innovation, must be done with care to remain open but sufficiently structured to encourage high levels of diverse contribution.

*Underappreciated sources of variation among platform participants.* The empirical and conceptual focus of much research has been on the focal firm or platform leader without appreciating how participating firms on ‘the other side of the platform’ adapt their strategies. Our research contributes a dynamic perspective of platform participants’ behavior and complicates their intention. Despite the fact that competition is a critical driver of partnership dynamics (Nalebuff and Brandenburger, 1996); and core firm strategy (Porter, 1980), platform scholars tend to assume that all firms (other than the focal firm) engage with a platform cooperatively
(Gawer, 2014 an exception) and complements are presumably undifferentiated (Parker and Van Aylstne, 2017). Our research questions this assumption and suggests that the mere fact of platform participation is not sufficient evidence to determine if a complementary relationship exists. We encourage scholars to look “under the hood” to determine how participation can be leveraged to serve potentially competing interests.

Both cooperating and opportunistic firms in our study contributed to Eclipse and, under open and collective conditions, assumed leadership roles, but to different ends. When opportunists participated, they did so to further their own interests even when those interests could be depletive to the value of a platform; when cooperative firms participated, contributions were typically accretive to the value of the platform. Scholars suggest that opportunistic behavior, resulting in competition may limit innovative outcomes (Boudreau and Jeppesen, 2015) and at an extreme, destabilize an ecosystem (Wareham, Fox and Giner, 2014). Thus, platform leaders often selectively manage access to prevent opportunistic actors from gaining an informational advantage (Henkel, 2003; Baldwin and Henkel, 2015); or from innovating into strategic markets core to the focal firm (Gawer and Henderson, 2007; Van Aylstne, 2016). Scholars suggest that the persistent participation of depletive, “opportunist” firms with a platform represent a failure of platform governance (Eisenmann et al, 2009). However, during all phases of our study, opportunistic firms enacted strategies that threatened the quality and vitality of the Eclipse platform to further their own interests. One might question - why was this tolerated? Our data suggests that opportunists played a vital role in the ecosystem by using Eclipse and extending it new ways, making others aware of the direction in which the platform could evolve. Since Eclipse was public, open and accessible in its later phases, opportunists
could gain a temporary informational advantage, but so could other participants in tracking the strategic moves and activity of opportunistic firms (e.g., Allen, 1983).

We have taken an initial step to identify differences in platform alignment that persisted under different governance conditions, but further research could predict which types of firms are likely to act cooperatively vs. act opportunistically. Since we were interested in understanding the adaptations firms make when engaging with a platform, our research design is focused only on those firms deciding to participate with the platform. We cannot predict which types of firms were more likely to participate. In this research, we focused on participants’ cumulative strategic choices and identified a limited set of platform strategies but these likely constitute only one component of a firm’s broader strategy. We did not trace firm level strategic changes but recognize that these may also affect participation with external platforms. Our framework specifies a range of platform governance domains and a range of strategic choices that may enable further comparative analysis. Future research could examine whether firms in competitive or complementary industry segments are more or less likely to pursue the strategies we identified. In sum, while much scholarship has attended to the power of platform leaders and their singular ability to control a platform’s trajectory, the success of these platforms often depends on contributions from vital communities of participants. We contribute an initial step toward understanding not only the conditions shaping participants’ platform strategies but also a renewed appreciation of how participation from diverse participants affects ecosystem vitality.
References:


Altman, E. (2017 forthcoming)


Chesbrough, H and Appleyard, M (2017 forthcoming)


Rietveld, J & Eggers, JP. 2016. Demand heterogeneity and the adoption of platform complements. Working paper available at SSRN.


<table>
<thead>
<tr>
<th>Firm</th>
<th>Joined Eclipse</th>
<th>Size (Revenue $M)</th>
<th>Industry</th>
<th>Sub-Industry</th>
<th>Public vs. Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm 14</td>
<td>2002</td>
<td>10,000</td>
<td>Software</td>
<td>Business applications</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 9</td>
<td>2002</td>
<td>700</td>
<td>Software</td>
<td>Database Management</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 12</td>
<td>2002</td>
<td>15</td>
<td>Software</td>
<td>Development tools</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 8</td>
<td>2002</td>
<td>10</td>
<td>Software</td>
<td>Development tools</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 15</td>
<td>2002</td>
<td>&lt;5</td>
<td>Software</td>
<td>Development tools</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 16</td>
<td>2002</td>
<td>200</td>
<td>Service</td>
<td>IT Services</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 5</td>
<td>2002</td>
<td>79,000</td>
<td>Hardware</td>
<td>Printing, Imaging</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 12</td>
<td>2003</td>
<td>5</td>
<td>Software</td>
<td>Development tools</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 4</td>
<td>2003</td>
<td>1,500</td>
<td>Software</td>
<td>Business intelligence</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 10</td>
<td>2003</td>
<td>&lt;5</td>
<td>Service</td>
<td>IT Services</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 7</td>
<td>2003</td>
<td>34,000</td>
<td>Hardware</td>
<td>Microprocessors</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 3</td>
<td>2004</td>
<td>100</td>
<td>Software</td>
<td>Business intelligence</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 13</td>
<td>2004</td>
<td>&lt;5</td>
<td>Service</td>
<td>IT Services</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 1</td>
<td>2005</td>
<td>1,000</td>
<td>Software</td>
<td>Application integration</td>
<td>Public</td>
</tr>
<tr>
<td>Firm 2</td>
<td>2005</td>
<td>5</td>
<td>Software</td>
<td>Development tools</td>
<td>Private</td>
</tr>
<tr>
<td>Firm 6</td>
<td>2005</td>
<td>2,000</td>
<td>Hardware</td>
<td>Telecommunications</td>
<td>Public</td>
</tr>
</tbody>
</table>
TABLE 2: Data Sources

<table>
<thead>
<tr>
<th>Phases of Control</th>
<th>Proprietary</th>
<th>Sponsor</th>
<th>Hybrid</th>
<th>Collective</th>
</tr>
</thead>
</table>

(1) Interviews (44)

(2) Observations (90+ hrs.)

(3) Archival Data

- 81 Board meetings
- Sponsor documents
- 11 Foundation financial reports
- 100+ Committee meetings, blogs and press releases
- 4 Analyst reports

Field Data

Archival Data
<table>
<thead>
<tr>
<th>Year</th>
<th>Proprietary</th>
<th>Sponsor</th>
<th>Hybrid</th>
<th>Collective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>IBM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Invite partners to test the in-process technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>• Open sourced the Eclipse Platform</td>
<td>• Acquire Rational, a member of the consortium</td>
<td>• IBM execs join Eclipse Foundation</td>
<td>• Pair back involvement</td>
</tr>
<tr>
<td>2002</td>
<td>• Commits 90% of all code</td>
<td>• All firms in the consortium participated in governance of Eclipse (one vote per firm)</td>
<td>• Form Eclipse Foundation</td>
<td>• Continue to lead the core platform project</td>
</tr>
<tr>
<td>2003</td>
<td>• Firm 8, 9, 16 start developing proprietary product that plug into the Eclipse IDE</td>
<td>• Firm 16, 5, 12, 9, 8, 11, 14, 15 join the Eclipse Consortium</td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Commit less than 60% of all code</td>
</tr>
<tr>
<td>2004</td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Firm 7 launches project</td>
<td>• Firm 3 joins the Eclipse Foundation</td>
<td>• Establish over-arching committees (1 vote per firm)</td>
</tr>
<tr>
<td>2005</td>
<td>• Firm 8, 9, 16 partner with IBM to test early &quot;Eclipse&quot; code</td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Firm 1, 2, 6 join the Eclipse Foundation</td>
<td>• Agree to publish an Eclipse development roadmap available to members months prior to releases</td>
</tr>
<tr>
<td>2006</td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Firm 7 launches project</td>
<td>• Firm 3 joins the Eclipse Foundation</td>
<td>• Initiate simultaneous release train for Eclipse 3.2</td>
</tr>
<tr>
<td></td>
<td>• Firm 8, 9, 16 partner with IBM to test early &quot;Eclipse&quot; code</td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Firm 1, 2, 6 join the Eclipse Foundation</td>
<td>• New projects supported by more than one firm</td>
</tr>
<tr>
<td></td>
<td>• Firm 7, 4, 10, 13 join the Eclipse Consortium</td>
<td>• Firm 7 launches project</td>
<td>• Firm 3 joins the Eclipse Foundation</td>
<td>• Firms 1, 3, 4, 5, and 9 either launch projects or takeover leadership of existing projects</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Membership (Access)</td>
<td>Designation of members and member rights – Who assigns voting rights?</td>
<td>IBM</td>
<td>IBM</td>
<td>Representative board</td>
</tr>
<tr>
<td></td>
<td>Designated voting rights – Who has voting rights?</td>
<td>IBM</td>
<td>Representative board</td>
<td>Representative board</td>
</tr>
<tr>
<td>Legal (Access/Control)</td>
<td>Ownership of IP - Who owns code donated to or developed for Eclipse?</td>
<td>IBM</td>
<td>Platform Participants</td>
<td>Platform Participants</td>
</tr>
<tr>
<td></td>
<td>Stewardship of IP - Who can check providence and assert licenses?</td>
<td>IBM</td>
<td>Platform Participants</td>
<td>Representative board</td>
</tr>
<tr>
<td></td>
<td>Development of derivative works - Who acquires rights to derivate work?</td>
<td>IBM</td>
<td>Platform Participants</td>
<td>Platform Participants</td>
</tr>
<tr>
<td>Architectural (Control)</td>
<td>Eclipse scope - Who determines the direction and scope of Eclipse?</td>
<td>IBM</td>
<td>IBM</td>
<td>unclear</td>
</tr>
<tr>
<td></td>
<td>Design coordination and rules - How are architectural decisions prioritized and coordinated across projects?</td>
<td>IBM</td>
<td>IBM</td>
<td>unclear</td>
</tr>
<tr>
<td></td>
<td>Project leadership - Who determines how new projects are launched?</td>
<td>IBM</td>
<td>IBM</td>
<td>unclear</td>
</tr>
<tr>
<td></td>
<td>Project requirements - How are project requirements captured and prioritized?</td>
<td>IBM</td>
<td>IBM</td>
<td>Project leaders</td>
</tr>
<tr>
<td>Technical (Control)</td>
<td>Release management - Who determines when projects are released?</td>
<td>IBM</td>
<td>IBM</td>
<td>Project leaders</td>
</tr>
<tr>
<td></td>
<td>Code commitment - Who determines who can commit code to a project?</td>
<td>IBM</td>
<td>IBM</td>
<td>Project leaders</td>
</tr>
</tbody>
</table>
### TABLE 5: Modes of Platform Governance

<table>
<thead>
<tr>
<th>Phase</th>
<th>Timing</th>
<th>Access</th>
<th>Control</th>
<th>Definition</th>
<th>Representative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary</td>
<td>2000</td>
<td>Closed</td>
<td>Sponsor</td>
<td>Complete legal ownership, technical control and decision rights over all platform domains</td>
<td>Firm 9, “When they started to think about Eclipse after it got to a certain point, at the time it wasn’t called Eclipse yet, and it wasn’t Open Source. It was just still inside of IBM as a project. It wasn’t commercial at all. It was not ready. They had a strategy and they had some code. But it wasn’t ready for prime time. But we got invited.”</td>
</tr>
<tr>
<td>Sponsor</td>
<td>2001-2003</td>
<td>Open</td>
<td>Sponsor</td>
<td>Open access to a platform under an open source license; sponsor or founder control of all architectural, and most technical and membership domains</td>
<td>Firm 13, “IBM walked around looking for columns to hide behind so that nobody would notice they were there. It is hard to explain, but they did take, it was a very aggressive neutrality posture because they were trying to create the perception that they weren’t in control, that they weren’t dominating, and so even though they were, you know how it is? It’s all Open Source. But you control 80 of the 82 guys that are developing it.”</td>
</tr>
<tr>
<td>Hybrid</td>
<td>2004-2005</td>
<td>Open</td>
<td>Unclear</td>
<td>Open access to a platform under an open source license; unclear or fragmented control of platform governance domains</td>
<td>Firm 12, “My question is does Eclipse.org have a policy or position? They said we have no policy, you all can do whatever you want, which is part of what has led to this. They have not actively promoted let’s all use one common core environment acknowledging that the pragmatics of that may be hard.”</td>
</tr>
<tr>
<td>Collective</td>
<td>2006+</td>
<td>Open</td>
<td>Collective</td>
<td>A representative board manages legal rights to the platform; community members manage the technical direction</td>
<td>Firm 1, “Concerns that we had before about levels of input and priority of input were going to be addressed because now as a board member, you can vote, argue, and discuss the direction of the Eclipse platform as it moves forward, and the requirements and the planning for that.”</td>
</tr>
<tr>
<td>Strategic Choice (N = 10)</td>
<td>Definition</td>
<td>Code Contribution</td>
<td>PI* Score</td>
<td>Representative Data</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>-------------------</td>
<td>-----------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Use Eclipse</td>
<td>Utilize Eclipse as an internal integrated development environment for the firm</td>
<td>No</td>
<td>1</td>
<td>Firm 13: &quot;Once we saw Eclipse, the development staff here started glomming onto it. That naturally, you know our developers started using it, they liked it.&quot;</td>
<td></td>
</tr>
<tr>
<td>Join Eclipse</td>
<td>Become a formal member of Eclipse consortium or foundation</td>
<td>No</td>
<td>2</td>
<td>Firm 3: &quot;It was a real simple decision. We did not make that decision for ourselves. It was kind of decided for us by our customers. Most of our customers initially were IBM customers as well. When WebSphere Application Developer came to play, they jumped on that wagon and they wanted us to support that effort…so, that was one of the major reasons initially why we decided to join Eclipse. So, we’ve been there since almost the very beginning.&quot;</td>
<td></td>
</tr>
<tr>
<td>Become a Board Member</td>
<td>Hold position on the board of stewards or foundation based on election or overall contribution to the community</td>
<td>No</td>
<td>3</td>
<td>Firm 12: &quot;When it first became visible to me, I really scratched my head and said this is the first time I ever heard of an Open Source project with a board of directors. An Open Source project that is fundamentally a consortium industry heavyweight. Prior to that it’s has always been the exact opposite. It’s organic amateur even when the individuals may be professionals in real life…. and then the corporations get involved to take advantage, contribute, very different evolution then this thing. So, I’m not aware of any similar technology where it started as a corporate technology. It’s immediately been created as “Open Source” with this corporate overlay with a board of directors.&quot;</td>
<td></td>
</tr>
<tr>
<td>Commercialize around Eclipse</td>
<td>Develop a proprietary product built on top of the Eclipse platform</td>
<td>No</td>
<td>3</td>
<td>Firm 1: &quot;We need to build on Eclipse. We need to stop what we are doing now, our last year of development building on this thing, and change and move onto Eclipse, because customers are demanding for it, and we just need to do it. We need to bite the bullet and slip our schedule and do it now. So then we decided to do that.&quot;</td>
<td></td>
</tr>
<tr>
<td>Donate Code/IP</td>
<td>Distribute freely and share existing IP or Code with open source community</td>
<td>Yes</td>
<td>4</td>
<td>Firm 13: &quot;The contribute aspect where commercial quality software appears overnight is still a bit of a problem. But what has happened in reality, even though code contributions, pieces of commercial tools, have shown up, they now go through a due diligence&quot;</td>
<td></td>
</tr>
<tr>
<td>Strategic Choice (N = 10)</td>
<td>Definition</td>
<td>Code Contribution</td>
<td>Intensity Score</td>
<td>Representative Data</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Join a Project</td>
<td>Contribute development capacity to an official Eclipse Project</td>
<td>Yes</td>
<td>4</td>
<td>Firm 5: &quot;It varies, and it goes up and down, probably between six and ten [developers working on Eclipse]. It goes up and down based on what we are trying to do….If we were driving our own platform with our own plug-ins, we’d probably need double or triple that number of people.”</td>
<td></td>
</tr>
<tr>
<td>Join Multiple Projects</td>
<td>Contribute development capacity to multiple Eclipse projects</td>
<td>Yes</td>
<td>5</td>
<td>Firm 8: &quot;We’ve got two Open Source, two Eclipse projects running right now. One we might have put in there anyway because we don’t care so much about it. The other one we did because we care.”</td>
<td></td>
</tr>
<tr>
<td>Develop Committers</td>
<td>Push developers to achieve status as &quot;committers&quot; which enables publishing of code into Eclipse community without peer review</td>
<td>Yes</td>
<td>5</td>
<td>Firm 12: &quot;They are committing to it. I think that you’ll find that people who are committing to it more, have a lot more committers it’s just the best way to gather information.”</td>
<td></td>
</tr>
<tr>
<td>Sync development schedule with Eclipse</td>
<td>Plan proprietary product releases to align with Eclipse releases (e.g., significantly before, after or with an Eclipse release)</td>
<td>Yes</td>
<td>6</td>
<td>Firm 15: &quot;I think you have to be prepared to be light on your feet. You have to be adaptive, and you have to be prepared to quickly move forward with initiatives based on what is going on with Eclipse. So, I think it’s time—it’s a critical time-to-market notion.”</td>
<td></td>
</tr>
<tr>
<td>Lead a Project</td>
<td>Architect, arbitrate and guide development of key priorities for an official Eclipse project based on inputs from the community</td>
<td>Yes</td>
<td>6</td>
<td>Firm 7: &quot;The complexity of integration. If counting on a component and dependent on features, implementation can get….that is why we are leading the project – at least in terms of managing the product, obviously we can’t go roughshod over everyone in the industry but as project leaders and board members, we have a great deal of influence over development cadence and feature support.”</td>
<td></td>
</tr>
</tbody>
</table>

**Key:** PI = Participation Intensity. Participation Intensity is ranked from 1 being the lowest level of intensity to 6 being the highest level of intensity. A strategic choice was assigned a participation intensity score based the level of effort required to initiate and implement a strategic choice.
### TABLE 7: Participant Strategies by Platform Alignment

<table>
<thead>
<tr>
<th>Alignment</th>
<th>Types of Strategies</th>
<th>Representative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooperative</strong></td>
<td></td>
<td>Firm 13: &quot;Naturally I watch the areas that first affect me. At Eclipse that is mainly things like the Web tools project that is out there.&quot;</td>
</tr>
<tr>
<td>(Firms 3, 4, 5, 6, 7, 9, 10, 11, 14)</td>
<td><strong>Observing.</strong> Actively took notice of direction and activity within the Eclipse community without contributing code back (Low Intensity - PI 1)</td>
<td>Firm 11: &quot;In the past we have had plug-ins to just about everything you can imagine. The idea of having one plug-in to write means instead of writing multiple plug-ins, our developers, can go and write more features for building. So, Eclipse is critical to us because of that reason.&quot;</td>
</tr>
<tr>
<td>Sub-Industries</td>
<td></td>
<td>Firm 7: &quot;We started looking across various opportunities and it started to become clear that one of the more appropriate places for us to contribute would be in the test and performance tools infrastructure which is where we have a lot of our new tools effort.&quot;</td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>intelligence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing</td>
<td></td>
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<tr>
<td>Imaging</td>
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<tr>
<td>Telecommunications</td>
<td></td>
<td></td>
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<tr>
<td>Microprocessors</td>
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<td></td>
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<tr>
<td>Database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
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<tr>
<td>IT Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Integrating.</strong></td>
<td>Integrated Eclipse code with existing proprietary product suite to enable compatibility with Eclipse (Medium Intensity - PI 2-6)</td>
<td>Firm 8: &quot;But we are there, we are involved primarily to watch. If they ever got their fundamental basic code to be better than ours, which right now it’s nowhere near as good as ours, then we’ll take theirs and put it under our product, because our user functionality sits on top of a bunch of stuff. They are really working down at a lower level. If they get good. we’ll just take it.”</td>
</tr>
<tr>
<td><strong>Expanding.</strong></td>
<td>Develop new Eclipse functionality and features to support complementary proprietary business (High Intensity - PI 6)</td>
<td>Firm 2: “So, at least part of my drive into Open Source will be it’s got to be a good enough teaser to get people to want to use it but will also adequately promote my stuff. You do lead generation is let somebody download a free version and then they like it, or you do like MYSQL and let them have it for free on business purposes. So, I’m probably going to use the Open Source stuff as a lead generation capability.”</td>
</tr>
<tr>
<td><strong>Opportunistic</strong></td>
<td></td>
<td>Firm 12: “Would I do holdbacks [holding back high quality code] too if I was sitting up there [leading a project]? No I wouldn’t. But I’d sure have an aggressive parallel commercialization program to try to get to market ahead of my competitors regardless.”</td>
</tr>
<tr>
<td>(Firms 1, 2, 8, 12, 13, 15, 16)</td>
<td><strong>Front-running.</strong> Offer proprietary, competitive products based on Eclipse code without necessarily contributing to Eclipse (Low intensity - PI 1-6)</td>
<td></td>
</tr>
<tr>
<td>Sub-Industries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>integration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selling up.</strong></td>
<td>Develop code on Eclipse that is limited or inferior to existing proprietary product offerings (Medium Intensity - PI 4-6)</td>
<td></td>
</tr>
<tr>
<td><strong>Redirecting.</strong></td>
<td>Prioritize build requirements based firm- interests; omit working on features or code that hinders firm competitive advantage (High Intensity - PI 6)</td>
<td></td>
</tr>
</tbody>
</table>
FIGURE 1: Adaptations in Participant Platform Strategies

Phase 1: Proprietary (2000-2001)


Phase 4: Collective (2006+)

Key: Firms’ platform strategies are plotted based on their platform alignment (x axis) and participation intensity (y axis) by phase. The black line indicates the point in which participation intensity includes contributions of code to the platform.