

BRICKS WITHOUT STRAW: OVERCOMING RESOURCE LIMITATIONS TO ARCHITECT ECOSYSTEM LEADERSHIP

Xianwei Shi

Antai College of Economics and Management, Shanghai Jiao Tong University,
No.1954 Huashan Road, Shanghai, 200030, China

Email: xianwei.shi@sjtu.edu.cn

Xingkun Liang

Department of Information Management, Peking University,
No. 5 Yiheyuan Road, Beijing, 100871, China

Email: lxk@pku.edu.cn

Shahzad (Shaz) Ansari

Cambridge Judge Business School, University of Cambridge,
Trumpington Street, Cambridge, CB2 1AG, UK

Email: s.ansari@jbs.cam.ac.uk

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ABSTRACT

While scholars have explored how focal firms harness demand-side value through ecosystem development, less emphasis has been placed on understanding how peripheral complementors become competitive. Unlike focal firms, complementors can seldom set value extraction rules. How can complementors lacking critical supply-side resources establish themselves as ecosystem leaders? We conducted a longitudinal analysis of Xiaomi, which began life as a smartphone software complementor within the Android ecosystem but ultimately gained architectural control by orchestrating the creation of a derivative ecosystem. We elucidate how these resource-disadvantaged firms may begin with fueling an “identity movement” among underserved users centered around a pivotal “foothold resource.” This movement serves as their entry point into an ecosystem and enables them to build a demand-side community. They then employ “demand pull” as concrete evidence to substantiate their vision, coalesce supply-side resources and ultimately become an orchestrator. While conventional strategy research emphasizes supply side resources as drivers of value creation, we explore the synergy between demand-side mobilization and supply-side orchestration. Finally, we illustrate how firms lacking resources craft compelling visions in conjunction with substantive actions to engage evolving target audiences. This approach allows them to secure more advantageous positions within the ecosystem, thereby transforming its structure over time.

Keywords: Demand-side View, Complementor Strategy, Ecosystems, Platforms, Sociology, Resource-Based View

INTRODUCTION

How firms build competitive advantage, especially when they lack critical resources, has long been debated in the strategy literature. Scholars who adopt the resource-based view (RBV) (Wernerfelt, 1984) typically examine supply-side resources, both inside the firm and in upstream factor markets, to explain how firms can build sustainable competitive advantage to create and capture value. Such an advantage is associated with the valuable, rare, inimitable, and non-substitutable resources (Barney, 1991) that firms own or access through inter-organizational relationships (Dyer, Singh, & Hesterly, 2018). However, as we know from studies on entrepreneurship, many firms, including most new ventures (Aldrich & Ruef, 2006), have ostensibly inferior resources relative to their resource-rich competitors (Miller & Le Breton-Miller, 2021), and yet still become competitive by finding better or new ways to serve the

demand side. Yet entrepreneurship studies still largely focus on creating value through supply-side resources (Clough et al., 2018), with only implicit attention to demand-side value creation.

Rather than examining how firms capture value from supply-side resources, the demand-side perspective in strategy focuses on consumer-facing firm strategies that create value for customers (Aversa, Haefliger, Hueller, & Reza, 2021; Priem, 2007). The burgeoning ecosystem literature has also shed light on how firms create value on the demand side (Adner & Kapoor, 2010; Aversa et al., 2021; Priem, Butler, & Li, 2013; Priem, Li, & Carr, 2012), and overcome their lack of proprietary resources by cultivating ecosystems with integrated offerings and distributed organizing (Teece, 2018). However, the focus in ecosystem studies is largely on the strategies of focal or hub firms that set the rules of participation (O'Mahony & Karp, 2022). With a few exceptions (e.g., Ansari, Garud, & Kumaraswamy, 2016; Mawdsley & Somaya, 2018; Wen & Zhu, 2019), relatively less attention has been given to peripheral or non-focal firms, such as small-scale suppliers and complementors that lack architectural control.

Complementors in particular are distinct, because unlike most suppliers, they independently provide complementary offerings directly to mutual customers to co-create the focal offer, and users decide whether or not to use them (Kapoor, 2018). Studies on ecosystems have begun to examine how established firms act as disruptive complementors (Adner & Lieberman, 2021), and how resource-endowed “star” or “marquee” complementors (e.g., Universal Music in Spotify) extract sizable rents, often by creating a position of power, or a “bottleneck” (Jacobides & Tae, 2015). However, less is known about how resource-disadvantaged, or run of the mill complementors gain control in an ecosystem. Often, start-ups without access to critical resources constitute the silent majority of complementors. Unlike star complementors, these complementors have little bargaining power vis-à-vis the focal firm

(Taeuscher, Bouncken, & Pesch, 2021). And, unlike a focal firm, they cannot set the rules of participation to orchestrate value around a novel offering. Thus, we ask: How does a resource-disadvantaged complementor architect ecosystem leadership?

To explore this question, we conducted a 9-year longitudinal study of Xiaomi, a firm that wedged into Google's Android ecosystem while also transforming it. The firm entered as a "second-tier complementor"¹ by fueling an identity movement around MIUI (a customizable version of Android) amongst users frustrated by Android's lack of customizability. After accumulating a sizable user base, the firm crafted a pioneering vision to mobilize supply-side resources and develop its own smartphones, thereby becoming a "first-tier complementor." Eventually, Xiaomi expanded into complementary product categories by developing an ecosystem leadership vision of the firm as an "orchestrator" of integrated products. Ultimately, Xiaomi gained architectural control in a derivative ecosystem without undermining its role in the primary ecosystem.

Our findings make several contributions to the literature. First, we offer a unique perspective on how firms that lack superior resources can create value by integrating the traditional supply-side view (Barney, 2001; Dyer et al., 2018; Lavie, 2006) with the demand-side view (Aversa et al., 2021; Priem et al., 2012). We introduce the concept of a "foothold resource," a product that enables the firm to foment an identity movement (Rao & Dutta, 2018) around a mundane resource. By co-developing this resource with users and fostering a sense of community, the firm transforms customers into dedicated fans who feel a deep sense of connection with the firm. Our findings offer a new approach to value creation that prioritizes community engagement and co-creation.

¹ We define "second-tier complementors" as firms whose offerings (e.g., MIUI) complement those of first-tier complementors (e.g., smartphone OEMs) of the focal firm (e.g., Android) in the primary ecosystem.

Second, we show how peripheral start-up firms can successfully penetrate an ecosystem despite having no track record. We demonstrate how these firms leverage the market potential of a demand-side community to persuade reputable firms to partner with them and provide superior supply-side resources. While the importance of appealing entrepreneurial accounts in enrolling a target audience is well-established (e.g., Logue & Grimes, 2022; Lounsbury & Glynn, 2019), we show how entrepreneurial accounts become more compelling when they evoke emotion and are accompanied by concrete actions and “material proof” that demonstrate value beyond mere words. Our findings demonstrate the importance of both compelling visions and substantive strategies for peripheral firms to successfully navigate ecosystems.

Third, we extend the conventional structural perspective of ecosystems that focuses on economic and technological complementarities (e.g., Adner, 2017). We propose a sociological understanding of how peripheral firms can not only fit into established ecosystems, but also transform an ecosystem’s structure (Dattée, Alexy, & Autio, 2018) through offering a compelling vision and nurturing a dedicated user community. Our findings suggest that gaining a structural advantage in ecosystems does not require a disruptive approach that extracts value from others, but rather a mutualistic “rising tide lifts all boats” approach (Khanagha, Ansari, Paroutis, & Oviedo, 2022), where all members benefit from the growth of the ecosystem.

ECOSYSTEMS, CRITICAL RESOURCES, AND COMPLEMENTOR STRATEGY

A prominent approach in strategic management, the RBV (e.g., Barney, 1991) explains sustainable competitive advantage as a function of valuable, rare, inimitable, and non-substitutable resources within the firm, in upstream factor markets (Peteraf & Barney, 2003), or in inter-organizational relationships (Dyer et al., 2018). The focus is primarily on the superior supply-side resources a firm owns or shares with other firms (Massa, Tucci, & Afuah, 2017).

Related research on dynamic capabilities or the superior ability to recombine and orchestrate different resources (e.g., Teece, 2007) recognizes the need to attend to changing customer demands, but still largely focuses on building and leveraging supply-side capabilities. Most firms in an industry are at a competitive disadvantage because they have objectively inferior resources and capabilities relative to their competitors (Zander & Zander, 2005). However, we know relatively little about how such resource-disadvantaged organizations become competitive (Miller & Le Breton-Miller, 2021; Tripsas, 2008).

Theories of entrepreneurship (e.g., Aldrich & Ruef, 2006) have shed light on the resourceful behaviors of underdog firms in adverse circumstances to create “something from nothing” through bricolage (Baker & Nelson, 2005) and “bootstrapping” (Winborg & Landström, 2001), and by learning to do more with less. However, the focus is still largely on assembling a set of supply-side resources—financial, human, cultural, and social—to “turn lead into gold” (Clough et al., 2018), with only implicit attention to demand-side value creation.

Yet, the last two decades have seen the meteoric rise of entrepreneurial firms like Amazon, Tencent, Uber, and Airbnb, which have created tremendous value despite lacking valuable supply-side resources initially. These firms and others cultivated thriving ecosystems that recognized emerging customer preferences and cultivated a large user base (Shi, Liang, & Luo, 2023). In fact, for firms like WhatsApp, LinkedIn, and YouTube, value is tied more to the size of the user base rather than ownership of valuable resources. Thus, by focusing on supply-side resources, we may be missing opportunities to create value that arise from the demand side.

Advocates of the demand-side view of strategy have long recognized the importance of customers as the ultimate “arbiters of value” and have explored how firms without superior resources create value by focusing on underserved customers and tapping into market niches

ignored by stronger rivals (Priem et al., 2013; Ye, Priem, & Alshwer, 2012). The demand-side perspective eschews the RBV's emphasis on capturing value from supply-side resources, and instead focuses on consumer-facing firm strategies and business models that create value for end users (Aversa et al., 2021; Priem, 2007).

The demand side, of course, is not new to strategy scholars. Long ago, Peter Drucker (1954: 37) asserted, "the customer is the foundation of a business," and Edith Penrose (1959) argued that companies grow when they attend to consumers. Indeed, in studies examining firms and ecosystems, technology scholars have addressed how customer heterogeneity matters for firm strategy (Adner & Zemsky, 2006). However, these studies have typically addressed focal firms' (e.g., Amazon) ecosystem strategies, i.e., how they effectively orchestrate and align pooled resources for joint value creation in conjunction with complementors, suppliers, partners, and competitors (e.g., Adner, 2017; Kapoor, 2018; Teece, 2018), and secure their focal role in an ecosystem. Such lead organizations have been labeled orchestrators (Thomas & Ritala, 2022), platform leaders (Gawer & Cusumano, 2002), hubs (Jacobides et al., 2018), architects (Daymond, Knight, Rumyantseva, & Maguire, 2023), and keystones (Iansiti & Levien, 2004). Yet, few studies have addressed the strategic challenges faced by non-focal actors (McIntyre & Srinivasan, 2017) without architectural control, such as Amazon's third-party vendors. This is surprising given that such firms comprise the vast majority in a typical ecosystem.

Complementors as a Distinct Constituent in an Ecosystem

Complements are products or services that enhance or enable an industry's core offer and complementors are the firms that provide them (Adner, 2017). Complementors are "neither buyers nor suppliers to the firm" (Kapoor, 2013: 5), but actors that independently provide "complementary products or services directly to mutual customers" (Yoffie & Kwak, 2006: 89-

90). The role of complementors has long been recognized by game theorists (e.g., Nalebuff & Brandenburger, 1997), technology historians (e.g., Hughes, 1982), and more recently, strategy scholars (Adner, 2017; Teece, 2018). Although their specific offerings differ, it is generally agreed that complementors are interdependent but autonomous actors that, unlike suppliers, do not have contractual obligations to the focal firm. Unlike “principal-agent” relationships between buyers and suppliers which are defined by contractual obligations, focal firms and complementors have voluntary “principal-principal” relationships (Autio, 2022).

These relationships differ in several ways. First, the nature of interdependence between firms and suppliers is sequential, in that users do not directly interact with suppliers’ offerings, which are bundled or integrated into the final offering before it is sold. In contrast, the nature of interdependence between firms and complementors is pooled, in that downstream users decide whether or not to use complementary offerings (e.g., end users in the Android ecosystem decide which apps to use) (Adner, 2017). Second, firms typically manage buyer-supplier relationships through procurement, marketing, and sales functions. However, in many ecosystems, firms neither buy from nor sell to complementors, but still need to coordinate activities to ensure compatibility (Baldwin, 2018). Third, complementors have varying degrees of complementarity. Strict complementarity exists when the focal offer and the complement have no standalone value apart from joint-use, such as a coffee machine and an espresso capsule. In cases of supermodular complementarity (e.g., Jacobides et al., 2018), more of the complement (i.e., better performance, greater availability) amplifies the value of the focal offer (e.g., the availability of a wide variety of high quality games increase the value of Sony PlayStation). Fourth, suppliers and buyers often form *dyadic* relationships of knowledge sharing, spillovers, co-specialization, and integration (Cheung, Myers, & Mentzer, 2011; Dyer, 1996), whereas complementors form multilateral

(*triadic*) relationships, simultaneously learning from the focal firm and users. Unlike buyer-supplier relationships, triadic relationships are not decomposable into dyadic or bilateral relationships (Adner, 2017; Davis, 2016). For example, Alcacer and Oxley (2014) explained how Personal Computer OEM suppliers gained technological capabilities by selling to branded mobile phone producers, and marketing capabilities by selling to mobile telecoms.

While recent studies have begun to address complementor strategies in an ecosystem (Kapoor, 2018; Wang & Miller, 2020), they have often addressed well-established firms (Adner & Kapoor, 2010), and premium complementors (Jacobides & Tae, 2015) that own critical supply-side resources such as proprietary technologies, intellectual property, or brands. By creating bottlenecks, such complementors have more bargaining power with an orchestrator (Hannah & Eisenhardt, 2018). For example, major book publishers withhold key content from Amazon's Kindle e-book platform and offer it exclusively through printed books to increase their bargaining power vis-à-vis Amazon (Wang & Miller, 2020). Similarly, Disney withdrew its valuable content from Netflix once it launched its own platform, Disney+.

Unlike star complementors, most complementors lack valuable resources such as a well-established brand. These firms make up the silent majority in a typical ecosystem and tend to be highly dependent on the focal firm. An example is the millions of firms in the hypercompetitive mobile app market for the Android and iOS platforms (Wen & Zhu, 2019). While some complementors attempt to decrease their dependence on a focal actor by “multihoming,” or participating in multiple ecosystems (e.g., by developing mobile apps for both Android and iOS) (Zhu & Liu, 2018), many find it difficult to compete, especially in ecosystems dominated by a powerful focal player (e.g., Teece, 2018).

Unless complementors control critical resources, they may also struggle to prevent

disintermediation by dominant platform leaders who encroach on their product space and render them uncompetitive (Wen & Zhu, 2019; Zhu & Liu, 2018). For example, Amazon uses data about independent complementors operating in its Marketplace to launch its own competing products. Unlike a focal firm, these complementors cannot establish or change the rules of participation (e.g., algorithms) that shape ecosystem dynamics, and as competition intensifies, their ability to capture value is further diminished (Rietveld & Schilling, 2021).

Although complementors with mundane resources have direct access to consumers, especially in open systems (Giudici, Reinmoeller, & Ravasi, 2018), it remains unclear how those without track records improve their competitive positions in an ecosystem. While an ecosystem is typically composed of a focal architect orchestrating value in conjunction with complementors, and other constituents, these roles are permeable to change. It would be useful to examine what kinds of strategies a complementor may employ to change its peripheral role and gain more centrality in an ecosystem (Thomas & Ritala, 2022). Thus, we ask: How does a resource-disadvantaged complementor architect ecosystem leadership?

METHOD

We sought to explain how peripheral complementors may gain an advantageous position in ecosystems with a case study (Siggelkow, 2007). Through theoretical sampling, we chose Xiaomi as a “revelatory case” (Eisenhardt & Graebner, 2007), as it adopted a unique approach to enter and expand the Android ecosystem. We conducted a longitudinal qualitative study through intensive engagement with Xiaomi and key constituents in the Android ecosystem.

Data Collection

We drew on various data sources, including archival data, semi-structured interviews, and participant observations. Table 1 summarizes the data we used in this study.

-----Insert Table 1 here-----

Archival data. We conducted a systematic search of secondary data on the Android ecosystem and the Chinese smartphone industry from Chinese and English news media, official websites, industry reports, yearbooks, annual company reports, and monographs. Our search was conducted within reputable databases, such as Web of Science, LexisNexis, Xinhua Multimedia Database, and search engines, based on three keywords and their close variants, “Xiaomi,” “Android Ecosystem,” and “Chinese smartphone industry.” We also examined company brochures, internal archives, presentations, Harvard Business Review articles, and detailed case studies on Xiaomi written in English and Chinese by institutions such as IMD, HBS, and CEIBS. We collected this secondary data comprising over 3,000 pages over nine years. Secondary data was useful for “reconstructing the unfolding of individual and collective action patterns leading up to relatively unique events” (Burgelman, 2011: 594). Thus, this body of data helped us to understand 1) the historical evolution of the Android ecosystem and Xiaomi’s evolving role within and outside Android and 2) Xiaomi’s operations, strategies, and performance.

Semi-structured interviews. Prior to our fieldwork, we iteratively developed an interview protocol to guide the semi-structured interviews we conducted. As our inquiry focuses on the mechanisms through which a resource-disadvantaged complementor architect ecosystem leadership, we designed the interview protocol to cover the motivations and outcomes of Xiaomi’s strategic decisions over time. As the ecosystem is “the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize” (Adner, 2017: 47), we sought to identify the interactions between Xiaomi and other ecosystem constituents within and outside Android. Our protocol, therefore, focused on four main topics: (a) context for Xiaomi’s vision, (b) Xiaomi’s substantive actions, (c) outcomes of

Xiaomi's vision and actions, and (d) Xiaomi's interactions in the derivative ecosystem. We tailored the protocol to the role of each respondent (e.g., supplier, complementor, or consumer) in the Android ecosystem and, later, Xiaomi's derivative ecosystem. In total, we conducted 112 semi-structured interviews, including two rounds of in-depth interviews with respondents both *within* and *outside* Xiaomi. Interviews lasted from twenty minutes to two hours. Interviews were conducted in Chinese, recorded, transcribed verbatim, and translated into English.

We followed theoretical sampling to select appropriate respondents based on their suitability to address our key queries. These respondents helped us to identify additional interviewees, as in snowball sampling (Lincoln & Guba, 1985), and included current and former employees of Xiaomi and other ecosystem constituents. Interviewing former employees allowed us to mitigate potential motivational biases that can develop amongst current employees when their organizational roles influence their responses (Lerner, 1976; Pettigrew, 1973).

We interviewed directors, middle managers, and employees in Xiaomi (n=40) from different functions related to its ecosystem strategy, such as marketing, R&D, supply chain, and ecosystem chain. For respondents outside the firm, we first selected key ecosystem constituents (complementors, suppliers, and customers) based on our initial mapping of the Android ecosystem (see Figure 1). Specifically, we chose complementors (such as China Unicom, app/skin developers etc., n=12) and suppliers (Foxconn, BYD etc., n=16) who were central to Xiaomi's emerging ecosystem. For customers (n=11), we interviewed customers who had been Mi fans for over 10 years and could trace back to the early period of Xiaomi's development. We complemented these interviews with respondents from Xiaomi's competitors (e.g., Huawei, OPPO, n=8) and industry analysts (n=3) familiar with the smartphone sector.

We conducted two rounds of interviews. During our first-round of fieldwork from June 2014 to March 2017, we studied Xiaomi and other constituents in Android, and the interviews lasted from one to two hours. We conducted a second round of fieldwork to collect additional data after 2018 to follow up on Xiaomi's efforts to establish a derivative ecosystem. We conducted multiple follow-up interviews (n=22) with directors from different functions within Xiaomi via (re-)visit, telephone, email, and social media (WeChat) to clarify inconsistencies and fill in gaps (e.g., Interviewee #18, added more information on how Xiaomi acquired smartphone chips in our second interview with him). These interviews generally lasted for less than 30 minutes. During all follow-up interviews, we also discussed our initial findings with our interviewees. Member checks confirmed our analysis and ensured that we constructed an accurate account (e.g., Interviewee #1 commented: "The demand-side perspective you mentioned is indeed consistent with what we are trying to do [leverage our user community]").

Participant observations. We conducted several observations from June 2014 to February 2023 to capture how different divisions within Xiaomi interacted and coordinated with other constituents in the ecosystem. During our company visits, we participated in group meetings with middle and senior managers who were aware of our researcher identity. We observed daily operations and strategy discussions in different divisions of Xiaomi, which helped us understand how Xiaomi developed its vision and acted accordingly. To complement the insider view on Xiaomi's strategies, two authors attended four customer campaigns and product launch events, as normal Mi fans where our researcher identity was not revealed. We observed informal group activities among Mi fans in order to understand how Xiaomi developed its user community. Similarly, two authors also joined Xiaomi's online forum (the virtual Mi Fan Community) as anonymous users, observing how Mi fans emotionally bonded (e.g., "[A geek]

fell in love with Xiaomi when attending Mi Mix's launch event. This amazingly innovative bezel-less phone let my emotions surge. I had never felt prouder as a Mi fan." Fieldwork memo, 22/02/2019). To complement the emic perspective that we developed during our study of Xiaomi, we hosted six focus groups, as moderators and observers, with scholars (e.g., Chinese Industry Study Group in Cambridge) and industrial practitioners (e.g., supply chain specialists and venture capitalists) familiar with the Chinese mobile phone ecosystem to discuss Xiaomi's ecosystem strategy, in Cambridge UK, and Beijing and Shanghai from 2014 to 2022. These focus groups allowed us to gain an etic perspective to reduce potential biases (e.g., Mi fans' views on Xiaomi). By taking notes of what transpired during these meetings, events, and online interactions, we used "time-authentic" data to cover an extended period and gain "access to interpretations at the time" (Zilber & Meyer, 2022: 386).

Data Analysis

Our data analysis involved four steps, moving back and forth between data collection, analysis, and the literature. During each step, we extensively discussed the emerging ideas to ensure reliability in our collective interpretations.

Step 1: Developing chronologies of events. Our dataset allowed us to establish three chronologies to contextualize key events and identify the roles of relevant constituents in the ecosystem's evolution: 1) Chinese mobile phone industry, 2) Android ecosystem in China, and 3) Xiaomi's development. We started with key events in the evolution of the Chinese mobile phone industry, from functional phones (2G since 1994) to smartphones (3G since 2009 and 4G since 2013). We identified key ecosystem constituents (e.g., suppliers such as RDA Microelectronics, OEMs such as Huawei, and complementors such as China Unicom). As Xiaomi was established in 2010, we paid more attention to the period from 3G onwards. We then analyzed Google's

strategic initiatives in launching and expanding Android in China. Finally, we built a timeline of Xiaomi's featured products, local market shares, and key strategic initiatives.

Step 2: Identifying temporal phases in the evolution of the firm and ecosystem. While the timelines only provide a sketch of “what happened,” we conducted a fine-grained analysis to gain insights into the “how” and “why” the firm attempted to change its role. First, we followed Van de Ven and Poole (1995) and Langley (1999) to examine all relevant ecosystem constituents and map out their interactions with Xiaomi (See Figures 1 and 2). These included core component suppliers (e.g., chip providers), complementors (e.g., network operators), and consumers (e.g., Mi fans). We followed Simmel's (1950: 137) typology on interactions, i.e., dyadic interactions that are “composed of only two participants” and triadic interactions that add a “third element” in a dyad, involving three or more participants. We identified Xiaomi's dyadic and triadic interactions with key ecosystem constituents. Dyads included “making friends with” consumers (Interviewee #27, 2017) and “dispatching around four employees to each plant [of OEM's]” (Interviewee #25, 2017). Triads included leveraging the growing user community “to knock the door of key suppliers that had initially refused [Xiaomi]” via direct contacts (Interviewee #11, 2015). By identifying these interactions with key constituents, we gained insights into Xiaomi's changing roles and relationships within the ecosystem.

Our longitudinal study allowed us to use temporal bracketing (Langley, 1999) to identify three distinct phases in which Xiaomi changed its vision and role within the Android ecosystem over time. Xiaomi moved from “a trivial UI provider on the edge of Android ecosystem” (Interviewee #3, 2014) to a “smartphone maker (in 2011) that significantly contributes to the market share of Android” (Interviewee #68, 2021), and finally, to an “orchestrator” to “develop its own ecosystem” in 2019 (Interviewee #81, 2022). We labeled these roles in the process model

(Figure 5) as R1, second-tier complementor, R2, first-tier complementor as a smartphone OEM, and R3, a focal player creating a derivative ecosystem while remaining a first-tier complementor. We combined our qualitative data with key performance metrics (e.g., market share data in Table 3 and size of user base and financial data in Table 4) in demarcating these phases. We also analyzed how Xiaomi interacted with ecosystem constituents *within* and *across* these phases, including sequences, patterns, and outcomes of interactions (e.g., Table 5). Specifically, we first focused on evidence of how Xiaomi's interactions with an ecosystem constituent (e.g., ODM Inventec) enabled its interactions with others (e.g., a downstream panel supplier). We then summarized the outcomes of these interactions (e.g., "access to [a key component]" and "gain trust among users" Interviewee #8, 2014). We mapped these interactions onto the timelines in Figures 2 and 3 to understand how Xiaomi transformed its role in the evolving ecosystem.

Step 3: Coding data to identify key mechanisms. We analyzed data through inductive coding (Gioia, Corley, & Hamilton, 2013) to reveal the underlying mechanisms that enabled Xiaomi to gain architectural control. We first sought factors underpinning these mechanisms in each phase via open coding that revealed over 100 codes, such as "customizing Android for Chinese users." We then organized these open codes into different groups, including performance, key challenges and opportunities, and the enrollment of key constituents.

To understand Xiaomi's interactions at the ecosystem level, we looked at "microprocess" that are "individual or collective processes and activities taking place at a lower level" (Kouamé & Langley, 2018: 561). Accordingly, in each phase, we coded for Xiaomi's interactions with key ecosystem constituents. For example, in Phase II, we looked at how Xiaomi enrolled suppliers by using a third element, such as "Xiaomi's large user base" (Interviewee #21, 2016) or "a top-tier supplier [of key components] already engaging with Xiaomi" (Interviewee #11, 2015). In Phase I

and III, we noted how Xiaomi evoked patriotic sentiments to attract consumers and second-tier complementors, such as “it totally reversed my view on ‘Made in China’” (Interviewee #80, 2022) or “support domestic manufacturers” (Interviewee #88, 2023). This allowed us to identify the microprocesses of how Xiaomi onboarded target ecosystem constituents.

Our axial coding focused on situating Xiaomi’s enrollment of key constituents with the contextual challenges and opportunities during each phase. We examined the contextual enablers and constraints, actions, and outcomes of Xiaomi’s interactions with ecosystem constituents in each phase. For example, two open codes (*lack of resources to create a supply chain* and *inability to convince suppliers*) illustrated Xiaomi’s difficulty as a “no name” firm to onboard suppliers. Then, we contrasted successful dyadic interactions (e.g., connection with consumers) with failures (e.g., rejection by suppliers) in light of the emerging challenges and opportunities (e.g., in Phase II, *C2 failures in dyads* and *O2 high growth potential*). We then linked the microprocesses “at a lower level” (Kouamé & Langley, 2018: 561) to the ecosystem-level mechanisms underlying how Xiaomi crafted compelling visions to enroll key constituents. For example, the microprocess 2(a) *leveraging demand-side support* and 2(b) *providing social proof* enabled Xiaomi to *craft a pioneering vision* as Mechanism 2 in the process model.

Step 4: Developing aggregated themes and a process model. Finally, by iterating between data and theory, we aggregated our categories into key theoretical themes that formed the foundation of our process model. For example, in Phase I, Xiaomi had “no experiences nor technologies in hardware” (Interviewee #5, 2020, second interview), and we termed Xiaomi’s mundane resources (user interface MIUI) as a “*foothold*” resource that are not typically a source of competitive advantage. We then incorporated literature on the demand-side (Priem, 2007) to illuminate Xiaomi’s approach of building a demand-side community around its foothold resource

that provided “great user experiences” (Interviewee #69, 2021) and was “optimized for the Chinese” (Interviewee #27, 2017). In a similar vein, by iterating between data and the literature, we derived two other aggregate themes.

To develop a model, we connected second-order categories and theoretical themes that emerged in Step 3 and 4 with temporal patterns identified in Step 1 and 2. While the categories (e.g., persuasion mechanisms, challenges, and opportunities) represent boxes in the model, the arrows between these boxes (e.g., dyadic and triadic microprocesses) depict “a motion picture” (Gioia et al. 2013: 22) to explain how peripheral firms architect ecosystem leadership.

We conducted additional analysis on the possible alternative paths regarding our process model by comparing Xiaomi to other firms in similar situations, both within and outside China. This allowed us to identify the boundary conditions of our model. Striving to be “analytical” and “show, not tell” (Cloutier & Ravasi, 2021), we drew on “power quotes” (Pratt, 2008) and live conversations to illuminate our narratives. See Table 2 for data structure and illustrative quotes.

-----Insert Table 2 here-----

FINDINGS

Overview: Xiaomi and the Smartphone Industry

The smartphone industry is dominated by two competing ecosystems: Apple’s iOS and Google’s Android. On the software side, the ecosystem built around iOS/Android includes firms providing complementary products to enhance smartphone users’ experiences (e.g., app developers), battery manufacturers, mobile content providers, and telecoms. On the hardware side, OEMs produce smartphones that run on Android (e.g., Samsung and Huawei), or iOS, which is exclusive to Apple. As smartphones include a complex set of specialized components—chipsets, displays, batteries, camera lenses, etc.—the manufacturing process involves not only

specialized suppliers, but also electronic manufacturing service providers (e.g., Foxconn) that assemble these components (Shi, Luo, Hou, Rong, & Shi, 2022). Whereas Apple exerts more control over its ecosystem, Google shares its source code with developers, allowing them to build on and modify Android. Figure 1 depicts Android’s ecosystem before Xiaomi’s entry.

-----Insert Figure 1 here-----

Usually, a smartphone maker seeking to be a key complementor to Android would specialize in a particular market segment based on its key resources and capabilities. For example, Huawei specialized in middle- to high-end smartphones based on its competencies in telecom equipment, and OPPO and VIVO specialized in sales channels to reach consumers in low-tier Chinese towns. Xiaomi had no competences in smartphone production, but eventually became the leading player in China and neighboring India—the two largest markets globally.

Xiaomi was established in Beijing in 2010 by Lei Jun (now its CEO) with experience in designing office software, and six other cofounders who had worked for leading firms such as Google and Microsoft. Xiaomi entered the Android ecosystem with MIUI, a customized user interface for Chinese customers that enabled Google to increase Android’s market share in China. After building an engaged consumer community, Xiaomi released its first smartphone (Mi 1) and rapidly gained market share to become a top-three smartphone vendor in China in just three years (Yu, 2015). In response to intense competition from Chinese OEMs such as OPPO and VIVO, Xiaomi partnered with fledgling firms to create integrated complements to its core offering, such as MIUI-controlled TVs and robot vacuum cleaners, which further boosted its smartphone business. In 2019, Xiaomi became the youngest company to appear on the Fortune Global 500 list (Zhou, 2019). Figure 2 depicts Xiaomi’s evolutionary journey.

-----Insert Figure 2 here-----

We identified three main phases in Xiaomi's evolution: In Phase I, Xiaomi joined the Android ecosystem as a second-tier complementor by offering a customized user interface, MIUI, which attracted a large user base. In Phase II, Xiaomi expanded its role and became a smartphone maker by leveraging its users to obtain support from key constituents. In Phase III, Xiaomi created its own derivative ecosystem to offer complementary offerings around its smartphones. As shown in Figure 3, through this process, the Android ecosystem also expanded.

-----Insert Figure 3 here-----

Phase I: Building a Demand-Side Community by Leveraging Mundane Resources

Most OEMs (e.g., Samsung, Huawei, OPPO, VIVO) compete based on their capabilities in the design, production, and distribution of smartphones, which requires substantial resources that a start-up lacks. Xiaomi's entry into the Android ecosystem by leveraging a mundane resource to create value on the demand side was thus a departure from the typical approach.

Challenge 1: High entry barriers in the ecosystem. A player may enter a smartphone ecosystem as an OEM, a component supplier (hardware), or a complementor (software) (see Figure 1). Xiaomi could not enter as a hardware OEM, as it "did not have any experience" (Interviewee #18, 2016) in sourcing the right components and integrating them into a coherent product. Even resource-rich Google initially sourced its branded phones (e.g., Nexus One) from HTC and later bought the firm's smartphone division to develop hardware (Orphanides, 2017).

Just before Xiaomi entered the industry, the iPhone 4, launched in 2010, had gained popularity among young Chinese for its superior user experience and stylish design. "We wondered: Hardware-wise, Nokia and Samsung are great, but why does everyone still want an iPhone?" (Interviewee #22, 2017). Xiaomi's founder, Lei Jun, realized that the iOS provided a vastly superior user experience compared to the traditional Symbian, but the iPhone was too

expensive for most Chinese consumers. Lacking the know-how to make hardware, Xiaomi identified software as a more feasible point of entry. One R&D employee noted:

Apple's iPhone is famous for its user experience. We found that many other smartphone makers such as Microsoft and Nokia focused on developing better hardware. However, whenever users use smartphones, they only interact with software—more specifically, the user interface. They care about hardware only when the device halts, apps crash, or the display quality is low. So, it is clear where we should start. (Interviewee #19, 2016)

Xiaomi's founders realized that the software user experience was important to smartphone users.

Opportunity 1: Underserved user niche. “Software, but how?” (Fieldwork memo 2014.07.15). While it seems less complicated and less costly to enter as a software complementor, developing an operating system from scratch alongside a dominant one was not feasible for a small start-up. “Developing brand new operating systems was expensive and almost impossible for a beginner like us” (Interviewee #19, 2016). Even an established firm like Microsoft had failed in its efforts to establish Windows Mobile as a viable operating system.

The user experience (operating system) provided by established firms was “one size fits all,” even though some users wanted a personalized experience. As Apple does not allow any OEMs to use iOS on their smartphones, the turning point came when Xiaomi sensed an opportunity in Android to customize an established but undifferentiated OS based on underserved consumer demand. A senior employee from the MIUI division noted: “The openness of Android gives us an opportunity to customize...there was a huge demand for a Chinese-customized OS among early smartphone users” (Interviewee #3, 2014). The customization of Android, which already had open source code, was also attractive to Google that sought to gain market share over Apple in the Chinese market. A senior employee recalled:

We met with Andy [Rubin, creator of Android] almost every two months. He wasn't quite sure about Android's market in China at first. However, when iOS was released in China, he began to value the Chinese market, hoping to have more customized UIs [user interfaces] in China and more Chinese OEMs adopting Android. (Interviewee #5, 2014)

Persuasion mechanism 1: Crafting an emancipatory vision around a foothold resource.

While start-ups can build brand equity and gain consumer affinity through firm-led marketing campaigns, Xiaomi built a fan base by crafting an emancipatory vision and channeling the energy of underserved users. Whereas iOS offered “silky” user experiences, “almost all other OSs at the time were English-based or poorly translated into Chinese” (Interviewee #2, 2014, 2015). A key action to accumulate its first batch of “hardcore fans,” was to “emancipate low-income geeks” (Fieldwork memo, 20/03/2016) from a standardized OS (e.g., Android 2.2 Froyo) with little room for customization. These “geeks” were typically Chinese Millennials who had grown up with a strong sense of “engineering rules.” They admired and strongly identified with technology giants, and in the early 2000s, Apple’s CEO, Steve Jobs, was the most popular technology figure in China.² To attract these “geeks,” Xiaomi’s CEO, Lei Jun, mimicked Steve Jobs’s “engineering” style to interact with MIUI fans. A marketing employee of Xiaomi noted:

Our targeted consumers are precisely college students with an engineering background in their early 20s. They are technology geeks who love Steve Jobs and the iPhone but cannot afford one. We offer MIUI for them to install on cheaper smartphones of other brands but promise a similar experience. Lei Jun’s imitation of Steve Jobs in his outfit in front of the public also added to the sense of “engineering and technology.” (Interviewee #9, 2015)

These geeks were frustrated by the lack of customizability of Android. Xiaomi offered them an opportunity to address their unmet needs and showcase their skills and experiences by creating an expandible, mutable, and “incomplete” artifact: a user interface for Android. The company allowed early users to play with it and learn from their peers:

Author: How did you come to know this [MIUI]?

Geek: From a tech forum. The moderator posted something about a customizable user interface [MIUI]. Thought it would be a nice fit with my old phone...

Author: To turn it into a “fake” iPhone?

Geek: Right, right. In our circle MIUI is quite popular. The experience of Android was quite awful, and you can’t do anything about it. That’s the worst part. (16/08/2014)

² Meet Lei Jun: China's Steve Jobs Is The Country's Newest Billionaire: <https://www.forbes.com/sites/ryanmac/2012/07/18/meet-lei-jun-chinas-steve-jobs-is-the-countrys-newest-billionaire/>

By tapping into this user group frustrated by Android, Xiaomi fueled a movement “among the techies” (Fieldwork memo 19/03/2016) and channeled their energies. Such an emancipatory vision was catalyzed by two dyadic microprocesses that we gleaned from our analysis.

First, Xiaomi *cultivated a community of users to democratize innovation* by enabling them to customize the Android interface, thereby incorporating “the voice of the user” into the software experience (dyadic microprocess 1a). “We thought it may be a good starting point to build our identity as a user-participatory developer and assemble these users in a co-developing community” (Interviewee #19, 2015). Xiaomi created an online forum for users to interact, share their experiences using MIUI, and offer suggestions for improvement. Lei Jun (Xiaomi’s product launch event, 2014) recruited 100 volunteers from the forum as “investors of our dreams” to co-develop MIUI. He described the company’s approach for engaging hardcore fans: “Xiaomi is not selling a product, but an opportunity to participate... Every user becomes your R&D, every user becomes your sales, every user becomes your friend, that’s the company we want to make” (Yu, 2015: 12). User participation was not limited to learning and brainstorming new features of MIUI. Rather, the firm encouraged users to engage in “co-designing” new versions of the interface. Instead of designing *for* users, Xiaomi designed *with* users. For example, users developed sought-after skins for MIUI (e.g., a Harry Potter-themed UI) and shared their innovations in the online “skin store,” thereby increasing traffic on Xiaomi’s online store.

Xiaomi also leveraged popular Chinese social media such as Sina Weibo (similar to Twitter) to create more channels for user participation. The firm engaged a growing fan base in an intensive online dialogue by “assigning engineers to read and reply to fans’ comments as a daily routine” (Interviewee #3, 2014), and organizing festivals and social gatherings to solicit suggestions for product improvement. One Xiaomi fan noted the power of users:

What's unique about MIUI is that it feels like a close friend. You can express your idea to them via the official forum [of MIUI], or via Sina Weibo to @ any relevant manager. And MIUI does listen to us [the users]. Some of my feedback has been quickly adopted in the new version and I can also vote to determine new features [of MIUI] ... I felt like someone powerful in the development team! (Interviewee #42, 2018)

To further promote user participation, Xiaomi does not only listen to users but incorporates user feedback through rapid iteration that maintains user enthusiasm. It releases a list of features for fans to vote on, and the features that receive the most votes are incorporated into the next release. While weekly software upgrades seemed difficult for most firms, Xiaomi achieved them through engaging online with its hardcore fans, who requested new features or suggested improvements to existing ones. As Xiaomi's CEO explained: "When Apple develops its iOS 7 you have no idea what they will do with it before its release. It is not like that for us. We'll first ask you what you want" (Yu, 2015: 9). A R&D manager at Xiaomi elaborated:

We insist on upgrading MIUI weekly. The beta version is for MIUI's real fans, who can participate in development as testers and provide feedback. When they are satisfied with the new functions, we integrate them into the development versions. Also, we provide a stable version for users who do not want to upgrade [frequently] or only want reliable upgrades. When your proposals are being realized in the new update, you will have the feeling that your voice is being heard and you are contributing. (Interviewee #20, 2016)

Such weekly updates were key to synchronizing Android's own updates and addressing the problem of version fragmentation. Google thus welcomed them. With MIUI, Xiaomi incorporated heterogeneous user voices into a software experience that used to be a firm-dictated "one size fits all" offering. By creating a space for participation, interaction, and collaboration, Xiaomi emancipated users from the rigid rules set by Android that did not allow personalization. Users could now have their say, share their experiences, and help Xiaomi enhance MIUI.

In a second microprocess, Xiaomi *evoked emotions to generate a sense of affiliation* (dyadic microprocess 1b). Xiaomi built emotional ties with its users around the notion that "a geek is supposed to play with MIUI" (Fieldwork memo, 26/07/2014) and leveraged them as

evangelists to attract ordinary users. This resonated with the digital native youth, as reflected in our conversation with an ordinary user who became a Mi fan:

Author: What was the moment that you find yourself a fan of Xiaomi?

User: My roommate was real crazy with MIUI and he took me to my first offline activity in the Mi fan club in our university. And it was viral—so much passion and fun.

Author: So it's kind of trendy for you to join the club?

User: Exactly. I mean, imagine yourself being recognized as a geek who knows how to play around with MIUI on any smartphones. (26/07/2014)

These offline “clubs” were sponsored by Xiaomi and organized by the hardcore patrons who held events and shared their MIUI experiences with ordinary users. Over 90 city-based fan clubs and over 200 college-based fan clubs assembled over 10 million users with shared interests in Xiaomi’s products, promoted user interaction, and created a mutual learning environment. By collaborating in offline activities, users developed a sense of belonging and affective bonding with Xiaomi. A hardcore fan described his feelings about the Xiaomi club:

Our club is like a big family. We come together due to common interests in MIUI. In the beginning we learned from each other how to use MIUI, how to customize its features, and how to install MIUI on smartphones of other brands. Gradually, we developed an attachment by hanging out together and became life-long friends. (Interviewee #57, 2020)

To strengthen its affective bonding with a growing fan base, Xiaomi evoked feelings of patriotism among Chinese users. Xiaomi nurtured a sense of “pride” among its user community by emphasizing how MIUI provided high-quality user experiences that stood in sharp contrast to the low-quality, “cheap” Chinese copycats. Product quality was so high that MIUI fans emerged in 24 countries and volunteered to translate MIUI into their own languages. A Mi fan noted:

When you use iOS, you can feel that Apple has paid close attention to every detail which comes at a premium price. However, when you use MIUI, it also paid attention to detail at an unexpectedly lower price. ... Xiaomi made me very proud that Chinese people can make a high-quality product. I was fulfilled when some overseas friends used MIUI in their own language and I taught them how to better use it. (Interviewee #63, 2021)

Thus, in addition to evoking emotions among tech-savvy users that motivated them to become evangelists, Xiaomi evoked patriotism and national pride by positioning itself as a “homegrown” brand embodying China’s technological progress and growing presence on the world stage.

Role 1: Entering as a second-tier complementor. Xiaomi entered the Android ecosystem with MIUI, a customized user interface that could be installed free of charge on Android-based smartphones. It thus became a second-tier complementor in the Android ecosystem by serving first-tier complementors (i.e., OEMs such as Samsung). See Figure 3 for how Xiaomi’s MIUI (depicted in red) complemented Android and the offerings of key OEM complementors.

Phase II: Building Supply-side Legitimacy without a Track Record

MIUI’s development paved the way for Xiaomi’s subsequent release of its own smartphone in response to growing calls from over 500,000 Mi fans. The firm’s earlier attempt to become a software platform by developing Mi Talk (an instant message app) had failed due to competition by Tencent’s WeChat. This prompted the firm’s pursuit of hardware. However, as a “nobody” new entrant with little credibility and legitimacy in the smartphone world, it proved to be immensely challenging to enter the hardware domain. Without a track record, it proved difficult to engage with reputable partners bilaterally. It thus sought to engage with them triadically by leveraging the fan base it had cultivated in Phase I as material proof of demand.

Challenge 2: Difficulty forming dyadic supplier relationships due to a lack of resources and legitimacy. After accumulating a large MIUI user base within a year, the firm aimed to launch an “affordable” iPhone-like product. However, Xiaomi lacked critical resources necessary to establish relationships with component suppliers, design smartphones, and integrate hardware with software. Becoming a low-cost copycat OEM serving rural markets in China akin to the manufacturers of “Shanzhai” mobile phones in the early 2000s (Lee & Hung, 2014) would have

seemed more feasible than aspiring to become a top-tier OEM that could compete with the likes of Apple or Samsung. An early venture capital investor recalled meeting Xiaomi's founder:

I was quite shocked during the first half-hour of our conversation: No one in China has ever succeeded in producing top-tier mobile phones from scratch. None of the Shanzhai manufacturers could compete with top-tier players. This is an industry with barriers ... Apple pivoted to the smartphone business with already successful products like the iPod; Nokia had experience in telecoms before they made mobile phones. (Archival data #414 – Xiaomi founder's official biography, 2015)

Entering the Android ecosystem as a “second-tier complementor” had enabled Xiaomi to assemble a user base, but it was unable to further monetize it. While it had grafted its way into the smartphone space as a software customizer, it was still far behind established OEMs as first-tier complementors. On the hardware side, a smartphone has over 800 physical components that need to work in tandem together with the software. Upfront costs made established companies reluctant to work with a start-up that did not have a brand or manufacturing facilities, because “their priority is always long-term production capacity and reputable clients” (Interviewee #4, 2014). These established firms usually seek “stable demand” from their customers as they “invest a lot into a production line to supply customized components for OEMs,” and they “don't want this [production] line only to be used once or twice a year” (Interviewee #31, 2017).

Foxconn, a renowned electronic manufacturing service provider and Apple's partner, refused Xiaomi's request almost immediately, doubting whether Xiaomi would “have enough quantity to justify investments to customize components, start new production lines, and make prototypes” (Interviewee #59, 2020). In addition, local firms making low-quality phones had sullied the reputation of Chinese OEMs, making top-tier suppliers wary of “unreliable” partners.

In the first half of 2011, the co-founders had over a thousand meetings with potential suppliers, but to little avail (Yu, 2015). As a start-up, Xiaomi could not access technological resources from major firms because “it is much more complicated than a simple buyer-supplier

contract” (Interviewee #31, 2017). Aspiring to make “high-end products,” Xiaomi “made a list of top-tier suppliers and sought collaboration with them one by one” (Interviewee #4, 2017). When Xiaomi reached out to top-tier suppliers, however, it was routinely rejected: 85 of the top 100 smartphone component suppliers refused to partner with Xiaomi. Despite a few prior relationships (Xiaomi’s co-founder had been a director in Motorola China), Xiaomi struggled to land a deal with top-notch suppliers. The director recalled a meeting with his acquaintance:

They [a hardware supplier] told me, “It’s great to see you back ... But I would rather not engage with Xiaomi in business—can you [Xiaomi] guys really achieve it [making a smartphone]? I’m afraid I can’t even justify my cost for production. (Archival data #107 – Xiaomi’s internal presentation, 12/08/2014)

As a “newbie” in the industry, Xiaomi also lacked experience negotiating, such that “even a screw supplier was unwilling to collaborate and ... asked for a three-year financial statement when [Xiaomi was] just one year old!” (Interviewee #33, 2017).

Opportunity 2: High growth potential of the ecosystem. Despite these challenges, there were opportunities, too. At the time, Android’s market share was small [just under 4% in China in 2009], but the fastest-growing” (Interviewee #2, 2015). The entire smartphone sector was growing rapidly, as “many people were replacing their feature phones with smartphones at the time, and there was some 50% market growth in 2011 compared to 2010” (Interviewee #34, 2018). However, Xiaomi had to overcome the challenge before it could ride the wave.

Persuasion mechanism 2: Crafting a pioneering vision around material and social proof. “We have all these fans; Can they help us?” (Fieldwork memo, 20/07/2014). Repeated refusals from potential partners prompted Xiaomi to rethink its dyadic approach to establishing partnerships. Without any credibility among suppliers or a track record, Xiaomi crafted a pioneering vision to paint a promising future and leveraged “demand-pull” in the ecosystem to generate support on the supply-side via multilateralism. The company leveraged the user

community it had nurtured in Phase I as material proof of widespread demand to persuade suppliers to become partners, and then used these initial connections to signal its credibility to other skeptical players. We identified two triadic microprocesses of crafting a pioneering vision.

First, Xiaomi *leveraged demand-side support and took substantive actions to establish supply-side legitimacy* (triadic microprocess 2a). Even before MIUI was launched, Lei Jun was convinced that Xiaomi could not survive merely as a second-tier complementor, and envisioned producing a MIUI-based phone “similar to iPhone but much cheaper” (Interviewee #11, 2015). Xiaomi crafted a pioneering vision – “the first smartphone of young Chinese” (Lei Jun, Xiaomi’s product launch event, 2011) – about how it planned to develop a low-cost smartphone with a first-class user experience. Moreover, Xiaomi assured suppliers that the substantive Mi fan base it had nurtured in Phase I would buy the product. Leveraging third-party influence from users, Xiaomi gained credibility with suppliers by articulating a promising vision of the firm’s future.

The most salient example is how such a vision helped Xiaomi secure a collaboration with a top-tier chipset company, Qualcomm. As a newcomer in the smartphone chipset segment, Qualcomm had “sought first-mover advantage in China’s smartphone market” (Interviewee #45, 2019) to compete with incumbents like TI and MediaTek. Qualcomm did not seek to collaborate with Huawei, China’s leading smartphone vendor, as it was Qualcomm’s competitor in 4G technology, and “smaller (Chinese) firms ... had a poor reputation” (Interviewee #45, 2019). Meanwhile, Qualcomm’s venture capital division had been closely monitoring the development of Xiaomi. A Qualcomm executive explained: “Xiaomi’s business model had potential since they had a growing user base ... who seemed to be ready to pay for the phone Xiaomi was going to release” (Interviewee #45, 2019). The vision of making a “cheaper” iPhone 4 for its “solid fandom” prompted Qualcomm to “partner with Xiaomi in the development process [of the

chipset for Xiaomi's first-generation smartphone]" (Interviewee #45, 2019). In a similar vein, Xiaomi's chief designer finally landed a deal after being turned down by every major contract manufacturing service (CMS) provider. He explained:

You know they [CMS provider] always want to know how many customers we have. We don't know actually. All I can say is that we now have 300,000 MIUI users as first potential customers. They are anticipating our smartphones running on MIUI. This might assure us of a huge order. I think our words are less reliable than the figure of our MIUI fans, which gives them [CMS] a clear sense of our market demand. (Interviewee #8, 2014)

Adopting a similar approach, Xiaomi also convinced a key complementor in the Android ecosystem, China Unicom (one of the largest mobile operators) to feature Xiaomi phones on its network. The strong user base for MIUI convinced China Unicom that the Xiaomi smartphone could be a viable mid-tier to low-end alternative to the high-end iPhone 4 it already offered.

China Unicom's regional manager explained:

As a leading operator, we are very selective on partners for contract phones. However, Xiaomi's product actually makes a lot of sense to us. While it was a fashion for people to buy iPhones in China, they were less affordable for the majority. Hence, Xiaomi's product filled a huge niche market [of people] who cannot afford the iPhone 4. Many of our customers recognized the [Xiaomi] brand and asked us whether we have a plan for its phone ... Considering all this, we chose Xiaomi as our partner. (Interviewee #15, 2015)

Besides leveraging its user base as "proof" to lend credibility to its vision of becoming a smartphone leader, Xiaomi made up for its lack of valuable resources by demonstrating "resourcefulness" in substantive actions. For example, Lei Jun and his co-founders flew to Japan just two days after the devastating earthquake in 2011, and told Sharp executives that they believed Sharp's smartphone display would help Xiaomi "design a better product for the vast majority of Chinese youngsters" (Archival data #425 – Xiaomi's internal presentation, 12/10/2015). Liu De recalled: "Nobody was flying to Japan at that time. We were the only passengers on the plane. Our willingness to fly to Japan after that disaster impressed the vendor, and they agreed to a contract" (Dann, Bennett, & Ogden, 2017: 5). The Sharp executives were impressed by Xiaomi's perseverance and how they "negotiated nonstop...from 8am until 11pm -

when they were thrown out of Starbucks” (meeting venue in Osaka, Japan) (Archival data #132, 05/2014³). These substantive actions lent credence to Xiaomi’s vision and enabled the firm to partner with an initial set of suppliers and complementors to enter the hardware business.

In another key action, Xiaomi engaged its fan community in product development and user-centric R&D. The firm drew on users not just for feedback, but as “drivers of product innovation” (Interviewee #13, 2015). Depending on their skills, Xiaomi categorized different fans as “developers, product testers, product ambassadors, and mainstream users” and encouraged their “participation in different phases, including product development, planning, design, testing, and release” (Interviewee #13, 2015). The firm gave users access similar to that of “internal engineers,” as well as “badges” to recognize and reward their contributions, almost blurring the line between employees and users. These actions made Xiaomi look more credible to suppliers and complementors in terms of the firm’s ability to make a user-centric smartphone.

In a second microprocess, Xiaomi *provided social proof from initial high-status connections* to signal credibility and gain access to more prestigious collaborations (triadic microprocess 2b). A supply chain manager described how the firm leveraged Qualcomm’s high-status reputation to gain legitimacy with skeptical players:

At the beginning, suppliers thought we were just another cheap Shanzhai OEM. But I realized that when they unintentionally saw Qualcomm’s logo, they became more interested in the conversation ... and some of them finally agreed to collaborate. From then on, I realized the power of showing Qualcomm’s logo, either intentionally or unintentionally, during my negotiation with suppliers. (Interviewee #11, 2015)

Xiaomi also gained support from Foxconn, which had repeatedly refused a manufacturing partnership with Xiaomi. The fact that Xiaomi onboarded reputable players as well as its growing customer base made Foxconn “quite regretful [for rejecting] their orders in the first instance” (Interviewee #17, 2016). Although initially unwilling to establish a partnership because

³ How Xiaomi Wooed the Best Suppliers: <https://www.ft.com/content/6a675fe2-a9c6-11e3-adab-00144feab7de>

Xiaomi “was nobody in the industry,” the success of Xiaomi’s initial smartphone convinced Foxconn that “it was the right time to collaborate” in order to be “less dependent on Apple’s contracts,” which accounted for 90% of Foxconn’s revenue (Interviewee #17, 2016).

As a top-tier CMS firm, Foxconn had direct relationships with component suppliers that received orders from OEMs and shipped their goods directly to the facility for assembly. Thus, Xiaomi could leverage Foxconn’s influence to establish partnerships with more top-tier component suppliers. This was reflected in our conversation with a manager at Foxconn.

Author: I can see the point why you would work with Xiaomi after that, but you mentioned introducing them to other suppliers?

Manager: Right ... both sides see this a shared mission. If we can help them gain more high-quality suppliers, they may have a better chance.

Author: So that you may have more orders?

Manager: A virtuous cycle, right. For us it’s a win-win situation, and our words are influential [for those suppliers, e.g., Dongming Xingye, a precision mold supplier].

Author: Because you are Foxconn.

Manager: We’ve been here [in this sector] for the past 20 years. (06/06/2016)

Role 2: Gaining power in the ecosystem as a first-tier complementor. After getting key constituents onboard, Xiaomi’s smartphone was finally launched. The first phone cost only 1999 CNY (\$320) compared to 5999 CNY (\$950) for an iPhone 4, targeting precisely the “geeks” that Xiaomi had attracted in Phase I. Xiaomi’s supply chain manager explained that to improve cash flow and ease financial pressure as a start-up, the firm took several steps to leverage its user community. First, the firm relied on its fans’ “megaphone” for free word-of-mouth marketing as “product ambassadors” instead of traditional advertising. The firm spent only 2–6% of its revenues on marketing compared to 10–20% for traditional smartphone firms. Second, Xiaomi convinced its fans to prepay for its smartphones prior to production via “online pre-orders,” ensuring “a precise prediction of inventory and production capacity and driving down costs significantly.” Third, the firm released only “one generation of smartphone each year” to benefit from falling costs of components over time “to achieve economies of scale” (Interviewee #26,

2017). Fourth, Xiaomi shifted manufacturing processes to partners to eliminate production lines and sent employees to these factories to co-develop products (i.e., “staff on demand”). Keeping costs low also built investor confidence in the financial viability of the smartphone business.

Xiaomi also reorganized internally to integrate solutions from suppliers across different sub-divisions and deliver a coherent smartphone product. A senior employee noted:

First, we re-organized the department according to the functions of each team. Second, we refined our internal process. We set up a weekly “product meeting” to discuss new product conceptualization with our boss and heads of all departments. Then, we have a “business meeting” in which we evaluate several prototypes to determine the final product. Once chosen, we also make decisions on production, quality control, R&D, advertising, timing, and allocation of resources. (Interviewee #70, 2021)

By 2014, Xiaomi had become a leader in the Chinese smartphone market within just three years of its founding. Rapid growth in the market for Xiaomi’s smartphones, especially outside China, increased the Android user base and contributed to Google’s revenues from advertisements, searches, and app downloads. Although MIUI operates more independently in China (Google services are banned in mainland China), MIUI-based smartphones sold elsewhere (e.g., India and Europe) offer Google’s baseline services (app store, cloud services, etc.), boosting revenues for both companies (see Table 3 for Xiaomi’s contributions to Android’s market share and revenue). According to the firm’s financial reports, its offshore businesses doubled from 2015 to 2019, and accounted for nearly 50% of total revenue. Alphabet’s operating revenues from Android-based advertising and cloud services outside the US also doubled (Alphabet’s financial report). Figure 3 depicts Xiaomi’s entry as a smartphone OEM.

-----Insert Table 3 here -----

Phase III: Creating a Derivative Ecosystem by Orchestrating Value Creation

Although Xiaomi’s smartphones were successful, competitors found ways to offset Xiaomi’s advantage by engaging their own user communities and offering a similar value-for-

money approach. Smartphone sales declined dramatically at the end of 2015. Having barely gained a foothold in the Android ecosystem, Xiaomi was struggling to squeeze more value from its low-margin smartphone business. Recognizing a need to cultivate additional sources of revenue, the firm combined the supply-side legitimacy it had gained in Phase II with demand-side synergies by incubating a set of smaller firms (second-tier complementors). In doing so, it created a derivative ecosystem around its core smartphone business.

Challenge 3: Diminishing advantage due to increase in supply-side homogeneity.

MIUI's success inspired many Chinese competitors. As MIUI's features were not difficult to imitate, the UI market became rather crowded, with each OEM releasing its own UI. "I was really worried about Xiaomi's future" (Fieldwork memo, 31/03/2017). Competitors "studied Xiaomi's approach every day" which "put Xiaomi under great pressure since 2015" (Interviewee #47, 2019). Huawei's Honor series directly competed with Xiaomi's affordable smartphones, and OPPO and VIVO undercut Xiaomi in China's rural areas, thanks to the market channels built by their parent company. Confronted with a 30% drop in market share in 2016 and thin margins, Xiaomi's smartphone business became hard to sustain. An executive noted the need to find alternatives: "Can we find an alternative point of growth after smartphones? We could not differentiate ourselves anymore with existing products in the market. This made us quite upset. Where should we be going? We kept asking ourselves this question" (Interviewee #6, 2014).

Opportunity 3: Supply- and demand-side diversification. Senior executives explored whether Xiaomi could diversify into other consumer domains, but engaged in intense debates about "what works" (Fieldwork memo, 26/08/2021). Unlike typical diversification strategies, the firm leveraged demand-side synergies to capture value. Xiaomi's expansion followed a sequential logic "to extend the use cases to many aspects of life," enabling users to control

aspects of “watching films, cooking, and lighting” with their phones (Interviewee #40, 2018).

This shift to the Internet of Things (IoT) was not obvious to the firm upfront, as revealed in our conversation with a Xiaomi ecosystem chain executive:

Author: “Were there any failures for the ecosystem-chain products at all?”

Executive: “[Subtle smile] Previously we tried infant products as we thought our fans who were married might need these for their children...But sadly, you know, Chinese parents never pursue a value-for-money approach [for their children].”

Author: “I can imagine. They want the best for their single child.”

Executive: “Exactly. We had long discussions after this failure and made it clear we should start with things that would work with our phones.” (26/08/2021)

Gradually, Xiaomi expanded into home appliances such as smart TVs and washing machines to create a connected smart home experience. Customers who bought Xiaomi’s “ecosystem chain products” (e.g., Mi TV ranked No. 1 in China) subsequently bought compatible Xiaomi smartphones and “reinforced [Xiaomi’s] main business” (Interviewee #40, 2018). Such demand-side synergies enabled Xiaomi to gain more control within and beyond the derivative ecosystem. An ecosystem chain director noted:

When any of the ecosystem chain products become popular, it increases our fan base and users’ confidence in Xiaomi. We hope users can switch to use our smartphones due to their user experience with other Xiaomi products. Working with ecosystem chain firms makes it easier to identify and accumulate other technologies. For example, with more ecosystem chain products, we realized the importance of the Wi-Fi module for smart home appliances and developed it ourselves to reduce costs (Interviewee #73, 2021)

The Mi Home app “significantly improves user experience” (Interviewee #40, 2018) with these products on other smartphones, but seamless experiences and compatibility (e.g., automation) are only available on Xiaomi smartphones with MIUI.

Persuasion mechanism 3: Crafting an orchestrator vision around demand- and supply-side as material proof. To persuade second-tier complementors to participate in its derivative ecosystem, Xiaomi portrayed itself as an orchestrator of supply- and demand-side activities. We identified three microprocesses associated with this persuasion mechanism that enabled Xiaomi to bridge demand-side synergies with the supply-side legitimacy it had gained in Phase II.

First, adapting dyadic microprocess 1a (i.e., democratizing innovation), Xiaomi *incubated a community of fledgling firms* (dyadic microprocess 3a). “[Our mission is] to incubate 100 ecosystem chain companies and change 100 sectors [with ecosystem chain products]” (Lei Jun, Xiaomi’s product launch event, 2018). A senior executive explained:

Of course, such a big project cannot be achieved by our company alone. So, we take advantage of the ecosystem chain through our investment, cooperation, and *incubation* [emphasis added], and enable them to achieve higher operational efficiency so that the whole industry can benefit. (Interviewee #77, 2022)

To scale up incubation, Xiaomi created an ecosystem chain department to oversee the design, coordination, and integration of new products. This department was “not aimed at creating subsidiaries of Xiaomi,” or being “an M&A department” focused on acquiring small companies (Interviewee #74, 2021). Rather, in exchange for a minority (20–40%) equity stake, Xiaomi gave partner firms access to capital, design, marketing, and supply chain relationships, and the right to co-develop, brand, and sell their products to Xiaomi’s user base. “Synergies among different ecosystem chain products” (Interviewee #74, 2021) increased traffic on Xiaomi’s online and offline retail channels and attracted more consumers into the ecosystem.

Notably, Xiaomi collaborated with only one firm in each complementary product category to demonstrate trust and goodwill. Each collaborator had exclusive access to Xiaomi’s full range of support and process management templates and received a “Xiaomi makeover,” adopting identity symbols (i.e., a minimalist aesthetic, a design language with clean lines and bold colors, simplicity, affordability) to signal their affiliation with Xiaomi’s ecosystem chain.

Xiaomi’s co-founder, Dr. Liu De, described this approach using an analogy from nature:

A pine tree can grow for 100 years, but also can die quickly. Nokia and Motorola were like pine trees. The Xiaomi Ecosystem is like bamboo. It can grow fast, and the bottoms of the plants are connected to one another. We looked for “baby bamboo” to invest in to help them become “big bamboo,” so we could create a bamboo forest. Bamboo grows fast and never dies, and though connected, each plant is individual. Our bamboo forest is made of separate companies that are connected and have a shared culture. (Dann et al., 2017: 9)

To nurture and champion these “baby bamboos,” Xiaomi shared its internal knowledge and capabilities in industrial design and sales. A senior Xiaomi executive elaborated:

In my view, the success of [an] ecosystem is not to span many industries, but to integrate with ecosystem chain firms and to develop competitive advantage for the whole ecosystem. We regard each ecosystem chain firm as a long-term partner, rather than a subsidiary. Thus, we can support ecosystem chain firms to overcome their weaknesses and support them with our industrial design capabilities and sales systems, or help them to bargain with their suppliers. When there are shared components, we can all get them at a lower price than what an individual firm can achieve. (Interviewee #75, 2021)

The firm also set up cross-boundary teams of engineers from Xiaomi, its suppliers, and second-tier complementors to oversee development and production of ecosystem-chain products and Xiaomi smartphones. An executive of one ecosystem chain firm explained:

Xiaomi has been collaborating with us deeply, from design to manufacturing. They appointed specialized staff in our factories, solving problems together with us. We even worked together to make the designers change their plans ... Even the head hardware manager [of Xiaomi] usually stays in our factories. (Interviewee #68, 2021)

Xiaomi also adapted dyadic microprocess 1b, this time *evoking emotions to create resonance with second-tier complementors* (dyadic microprocess 3b). The firm used a patriotic line, “The New Made in China,” with local companies to emphasize joint benefits and evoke “local pride” from participating in the derivative ecosystem around Xiaomi’s core smartphone business. A senior executive noted how Xiaomi mobilized local complementors by evoking pride: “We have sought out a methodology of doing business to make products that are both premium in quality and efficient in cost ... We want to change [the meaning of] ‘Made in China’ to reform the whole manufacturing sector” (Interviewee #77, 2022). This message resonated with many fledgling firms. Our conversation with a former “ecosystem chain” company owner:

Author: “So you were already doing great, and you got a few other investments...”

Owner of ecosystem chain company: “Yes, and you wondered why I decided to join Xiaomi’s ecosystem chain finally.”

Author: “Yes. I mean you have to give up something like your own brand to be part of Xiaomi’s family (Huami, Zimi..)”

Owner of ecosystem chain company: “The impulse came from watching Xiaomi’s new product event: “I like how Lei Jun framed it, ‘to create 100 Xiaomi in other sectors,’ ... we represent an entirely new image of ‘Made in China.’”

Author: “Did that remind you the old days as Shanzhai firms [copycats]?”

Owner of ecosystem chain company: “ha-ha. To some extent. I’m tired of being looked down upon by our competitors in Europe” (09/12/2019).

However, dyadic relationships were not sufficient for Xiaomi to establish partnerships with more prominent second-tier complementors, especially high-status firms. Xiaomi thus adapted triadic microprocess 2a, once again *combining supply- and demand-side synergies to attract more prominent partners* (triadic microprocess 3c). Specifically, Xiaomi leveraged the user community it had cultivated in Phase I to attract potential second-tier complementors through the purchasing power of its user community. Firms that made smartphone-linked products (e.g., wearable devices) and Xiaomi had overlapping consumer niches. When they joined Xiaomi’s derivative ecosystem, their products could be controlled by Xiaomi smartphones. The director of the ecosystem chain department noted: “On the demand side, our Mi fans love to buy ecosystem chain products alongside our phones. We sell them together and recommend these products based on big data to potential consumers who bought [compatible] Xiaomi devices” (Interviewee #79, 2022).

Xiaomi also took substantive actions to help firms negotiate with suppliers to secure components at affordable prices. The director of the ecosystem chain department explained:

On the supply side, when these ecosystem chain partners have less bargaining power in supply chains [similar to what Xiaomi faced in Phase I], we represent them in negotiating with suppliers. This also helps them get the cheapest deal as they share many components with our own products. (Interviewee #79, 2022)

Role 3: Becoming a focal player while remaining a first-tier complementor. Xiaomi sought to revitalize itself by producing complementary offerings or leveraging offerings developed by other firms around its smartphones to create a MIUI-based IoT. These ecosystem chain products included Xiaomi TVs, earphones, and air purifiers, and ecosystem chain products

such as Yeelight’s smart lighting, YunMi’s smart home appliances, and second-tier complementary products such as Philips’s smart lamps, Alipay, and Byte Dance (TikTok) apps. Figure 3 depicts Xiaomi’s expansion to create a derivative ecosystem (red dashed line) and Figure 4 illustrates how the firm’s ecosystem chain department orchestrated value around its core offering. In global markets, Google’s products (Google Play, Google Maps, Gmail) were not installed on Xiaomi phones by default to subtly direct users to Xiaomi’s app store, GetsApp. This was a non-confrontational way to compete without blocking Google’s products. Table 4 provides a financial breakdown of Xiaomi’s huge value capture from both smartphones and ecosystem chain products, with the latter yielding higher profitability.

-----Insert Figure 4 and Table 4 here-----

Xiaomi’s rapid rise did not come without setbacks, and it continues to confront new challenges. For example, despite a 2013 lawsuit filed by Ericsson in India that led to a temporary ban on Xiaomi smartphones, Xiaomi had regrouped by 2015 to become the smartphone leader. Currently, it faces a fresh set of challenges arising from geo-political tensions and regulatory tightening in the tech industry. Seeking avenues for growth, in 2021, Xiaomi allocated \$10 billion to develop electric vehicles and smart cars.⁴

HOW RESOURCE-DISADVANTAGED FIRMS ARCHITECT ECOSYSTEM LEADERSHIP

Abstracting from our findings, we develop a model (Figure 5) of how peripheral firms lacking valuable resources architect leadership positions in ecosystems and leverage mundane resources to “turn lead into gold” (Clough et al., 2018). This is important, because firms that

⁴ Xiaomi unveils plan to make electric cars: <https://www.ft.com/content/375faff8-6fd0-4d0c-b2b7-b1c13763786f>

achieve more centrality in an emerging ecosystem tend to capture more value (Hannah & Eisenhardt, 2018), whereas peripheral complementors tend to be exploited (Zhu & Liu, 2018).

-----Insert Figure 5 here-----

Our model shows how a peripheral firm progresses through three phases to architect a leadership position in an ecosystem: cultivating an engaged user community as an emancipator, leveraging this community to gain credibility with critical ecosystem constituents as a visionary pioneer, and positioning itself as an orchestrator of ecosystem activities. We identified three mechanisms that drive progression through these three phases, which we discuss below.

Mechanism 1: Crafting an Emancipatory Vision around a Foothold Resource

To overcome the challenges associated with entering an ecosystem (C1), in Phase I, a firm begins by identifying and addressing a niche opportunity (O1) and entering the focal ecosystem as a second-tier complementor (R1). The first mechanism captures how a firm crafts an emancipatory vision around a foothold resource. Such a vision is crafted via two microprocesses. By cultivating a user community to democratize innovation (1a), a firm can fuel an identity movement (arrow a) among users who feel constrained by the rigid rules of incumbents' offerings. By evoking emotions to create a sense of affiliation with the firm's offering (1b), a firm can create a shared socializing and learning environment, and foster feelings such as local pride to create a strong sense of affiliation (Arnould & Thompson, 2005).

Creating user communities is not a new phenomenon (Nuvolari, 2005). Indeed, as far back as 1955, a group of IBM mainframe users formed a community to share code tweaks they made to the operating system (SHARE, 2019). User communities built on shared attention and emotion can generate "collective effervescence" (Durkheim, 1912). People are "doing things" and "feeling things" collectively—"sharing the electricity or buzz generated by the event" (Rossner & Meher, 2014: 202). When successful, social mobilization generates affective bonding

that can help productively channel the energy of underserved users (arrow b) towards improving the firm's offering. Crafting an emancipatory vision around a foothold resource can enable a firm lacking valuable resources to build an engaged user base of dedicated fans.

Mechanism 2: Crafting a Pioneering Vision around Material and Social Proof

In Phase II, the firm confronts the challenge of harnessing critical supply-side resources (C2) as it seeks to gain power in an ecosystem to take advantage of opportunities for high growth potential (O2) and assume the role of a first-tier complementor (R2). The second mechanism delineates how the firm can enroll partners by crafting a pioneering vision around material proof of the demand it cultivated in Phase I. Such a vision comprises of two microprocesses: leveraging demand-side support (2a) to paint a promising future (arrow c) to gain supply supply-side legitimacy, and providing social proof from high-status connections (2b) to signal credibility (arrow d). Providing social proof involves using connections to “referent others” (Cialdini, 1993) to attract high status connections. This can lead to a virtuous cycle of positive evaluations.

While entrepreneurial accounts that convey a favorable picture of proposed initiatives may provide social proof for target audiences, it is hard for start-ups that lack credibility to bilaterally persuade firms through a pioneering vision. They may overcome such “dyadic exclusion” (Davis, 2016; Simmel, 1950) by triadically leveraging their user bases as material proof to bolster their vision. In our case, a “ready” demand side ensured that the promised vision did not ring hollow. Moreover, a firm can fuse visionary storytelling with substantive actions that show resourcefulness and demonstrate the firm's ability to deliver on its promises. To overcome a lack of internal expertise, a firm can leverage the dedicated users it has cultivated as if they were internal employees and assign them different roles in innovation. In our case, such concrete democratization of innovation amongst fans transformed users into “drivers” of product

innovation, and increased confidence in the firm's potential to deliver. By making use of triadic relationships in an ecosystem, a resource-disadvantaged firm can garner resources from key constituents to gain more power. Table 5 describes key constituents that Xiaomi onboarded.

-----Insert Table 5 here -----

Mechanism 3: Crafting an Orchestrator Vision around Demand- and Supply-side

As competition grows, a firm may be confronted with the challenge of a diminishing advantage in its core space (C3). In Phase III, a firm may pursue opportunities to diversify (O3) by leveraging support on the supply and demand sides to create and lead a derivative ecosystem and assume the role of a focal orchestrator (R3). Crafting an orchestrator vision involves three microprocesses. By incubating fledgling firms (3a) with specialized expertise, a firm can support the development of diverse offerings. By evoking emotions to create resonance with target groups (3b), a firm can reinforce a cohesive identity among incubated firms. Through these microprocesses, a firm provides the protection necessary for these smaller firms to grow and thrive—that is, it provides a “conservatory” (arrow e). The third microprocess, creating supply- and demand-side synergies to form new partnerships (3c), is triadic and allows an orchestrator to expand its range of integrated offerings (arrow f) to a larger user base.

An orchestrator not only supports small firms but can also unite them around a cohesive identity by providing a common design language and aesthetic. Cultivating close partnerships with local suppliers and manufacturers can foster a collective ethos and a feeling of national pride among smaller firms, imbuing them with a sense of belonging to a grander, purpose-driven movement (e.g., Xiaomi consistently evoked its “Made in China” identity as a symbol of Chinese technological advancement). While the idea of partnering and integration in ecosystems is a familiar concept, the distinctiveness here lies in the notion of forging a unified ecosystem

that seamlessly integrates a wide array of complementary products. This holistic approach ensures that users enjoy a seamless experience, and sparks a continuous cycle of growth – a positive spiral – that benefits not just the company but also its partners. Supply-side synergies are generated as users are incentivized to consume more of the firm’s and partners’ products, and demand-side synergies arise from the increased value that customers derive from “two possible sources of increasing returns of joint consumption (*within-customer group*) *one-stop shop effects* (OE) and (*between-customer group*) *network effects* (NE)” (Aversa et al., 2021: 4; Ye et al., 2012). These synergies are linked to consumer's increasing familiarity with a firm’s offerings, lower search costs, and benefits arising from interoperability across its product domains, as well as advantages from experiencing bundled consumption experiences.

Unlocking a novel perspective, the integration of supply-side synergies with demand-side synergies empowers an orchestrator to broaden its array of integrated offerings, extending its reach to a broader and more diverse user base. Although managing an integrative portfolio can be costly, leading to reduced profits or even losses for some businesses (e.g., Amazon Prime) (Aversa et al., 2021), we suggest that a firm can generate demand-side synergies by nurturing a constellation of specialized firms (i.e., “little bamboos”). Thus, a loss-making business may not be a necessary condition for running an integrated business portfolio.

Boundary Conditions and Broader Implications

Our model has several boundary conditions that limit a firm’s progression from one phase to the next. To enter the ecosystem and begin Phase I, the ecosystem must be open (i.e., Google’s Android platform), not closed (e.g., Apple’s iOS platform). An open ecosystem allows more versatility in integrating complementors and other ecosystem partners, and more potential for user customization than a closed system. However, even in an open system, a firm may not

be able to build a large user base if it remains narrowly focused, as Linux did. Yet, open platform architectures can have downsides, as complementors may contest and even exploit the focal firm, or tarnish its image by providing low quality offerings.

Second, the firm needs to be in a market with a potentially large user base in order to reach a critical mass that can serve as a leverage point during the migration from Phase I to Phase II. In our case, China's large population (including tech-savvy users) was an important factor in shaping Xiaomi's strategy. Likewise, Xiaomi became a leader in the world's second largest mobile market (India) by following a similar path as it did in China. In contrast, Linux's user community among professional techies in open source software was not sizable enough to enable the firm to become a more integrated vendor.

Third, to transition from Phase II to Phase III as a diversified orchestrator, a complementor needs to generate demand-side synergies among its complementary offerings. For example, although LeEco, a smartphone vendor in China, was able to develop a user community like Xiaomi, it did not create sufficient synergies among its diversified offerings. It invested heavily in PC content not compatible with its smartphones, which ultimately led to its failure in orchestrating value. In contrast, Steam, a video game digital platform, harnessed the power of users to discuss, rate, and trade games, but also generated synergies with the hardware it collaboratively produced, such as Steam Controller (complementary devices) and Steam Deck (core devices). Similarly, the Chinese electric vehicle vendor NIO cultivated a community of fans who embraced its vision for luxury electric vehicles (EVs), established partnerships with key collaborators to develop hardware, and then created its own ecosystem around its EVs—battery-swap stations, a fan club, service centers, and a smart driving assistant—to diversify and orchestrate value around its core offering. However, some firms may be better off in the role of

suppliers or complementors. For instance, the firm Thrasio has thrived as a complementor by identifying, acquiring and scaling businesses on the Amazon platform and leveraging its expertise in marketing, supply chain management, and operations.

Fourth, the emphasis on the demand-side does not diminish the importance of the supply-side strategy. At times, users may be unable to imagine, let alone express their needs. Thus, significant supply-side investments may be needed for offerings that initially fail to resonate with users. For instance, Airbnb's value proposition that people would stay in strangers' homes was initially resisted and it took a while for the idea to become acceptable (Gallagher, 2017).

Finally, while an ecosystem has advantages over a vertically integrated organization, hierarchical supply chain, or an open market model in that it enables actions to be coordinated without a disproportionate increase in transaction costs, it is not always suitable. Some firms may be better served by tight integration or outsourcing, while others (e.g., Apple) may develop hybrid forms such as combining vertically integrated organizing (hardware and software) with ecosystem organizing (software apps) (Williamson & Meyer, 2012).

DISCUSSION

The phrase "bricks without straw" in this article's title is taken from a biblical story about how Pharaoh punished the Israelites by telling his overseers to withhold straw (a necessary ingredient in brickmaking) while requiring the same daily output of bricks. Today, it is used to refer to performing a task with limited resources. We have developed a model that explains how peripheral firms may architect leadership positions, i.e., "make bricks without straw."

Integrating the Demand- and Supply-side Perspectives in Strategic Management

We have brought together the mainstream strategic management perspective emphasizing the supply side (i.e., firm resources as a source of value creation) with demand-side studies that

view consumers as a source of value creation. Our data provide evidence of the value of “social mobilization” (Rao & Dutta, 2018) to channel user skills and enthusiasm on the demand side. A firm can tap into the desires of underserved users and fuel an identity movement around its core offering. We call this offering a “foothold resource” that addresses a specific “pain point” within the market and bands together a community of users.

In our case, Xiaomi did not simply identify a market imperfection, or an unmet need, but premised its innovation on addressing the frustrations of an underserved niche of tech-savvy users and enthusiasts. This user niche wanted a “local Apple,” or an affordable, homegrown alternative to the upscale and expensive iPhone, but resented the restrictions of Google’s Android that did not allow any tweaking of the operating software. Xiaomi obliged by allowing personalization, soliciting and rapidly incorporating user feedback to maintain enthusiasm, and stimulating collaborative interactions among users. By creating a sense of collective ownership and camaraderie, Xiaomi was able to fuel an identity movement and cultivate a sizeable base of users who felt connected to each other and to the firm. Social mobilization is not just about creating a user base, but creating “fans,” or users with emotional affinity towards a firm’s offerings. A firm rallies such users by providing a foothold resource that channels their talent, enthusiasm, and desire to express themselves. It also provides a space to forge feelings of social solidarity or “we-ness” through the pursuit of common consumption interests (Kozinets, 2002).

From a supply-side perspective, strategy reflects a firm’s strengths or the position it seeks to acquire in the market. From a demand-side perspective, however, strategy is about identifying and serving a user niche with unmet needs. We suggest that a firm can strategically tap into underserved users who desire to express their identities and foment a movement around an offering that facilitates such expression, thereby fostering feelings of cohesion sustained through

interactions and collective learning. The company can then leverage this user base to develop expanded offerings and generate demand and supply-side synergies for its growing community. Effectively integrating the demand and supply sides can lead to significant value creation.

Gaining Power as a Complementor

We have shown how a peripheral firm without a track record or valuable resources (e.g., patents, proprietary technologies) can gain credibility with crucial strategic partners by crafting a powerful pioneering vision (Lounsbury & Glynn, 2019). While prior studies have suggested the importance of entrepreneurs' vision and promise that provide "social proof" or informational social influence (Cialdini, 1993; Logue & Grimes, 2022), our findings suggest that an emotionally evocative vision and "material proof" to corroborate them can make them more compelling. In our case, Xiaomi provided an expandible artifact (i.e., MIUI) that afforded user manipulation and co-creation, in contrast to competitors' non-customizable offerings. The firm promised "unmissable" future states through a pioneering vision of ushering in a new era of mobile telephony in the world's largest market. It also used emotionally evocative vision about a homegrown product as a source of national pride, thereby replacing negative connotations of "Made in China" with a new, positive meaning. We argue that an engaged, loyal demand-side community can be leveraged triadically to materially demonstrate the value proposition in a vision and make it more compelling. Such evidence can complement supply-side evidence such as proofs of concept, simulations, and prototypes. Moreover, visions that are accompanied by substantive actions that signal competencies and commitment (i.e., "walking the talk") can have greater resonance with target audiences. A firm with little credibility can make up for its lack of resources not just by crafting a pioneering vision, but also by showing "resourcefulness" (Fisher, Kuratko, Bloodgood, & Hornsby, 2017). In our case, Xiaomi showed initiative in creating and

seizing opportunities to establish partnerships with reputable firms that were necessary to diversify into hardware and gain power in the ecosystem.

We suggest that persuading targets may be more effective when a firm focuses on evoking emotions and complements its rhetoric with material persuasion and a tangible foundation. At the same time, entrepreneurial visions need to be tailored to target audiences; for example, Xiaomi portrayed itself in different ways over time to influence target audiences – users, established firms, and smaller firms – as it progressed through the three phases. Users may be more amenable to hype and emotion in a message (Logue & Grimes, 2022), which may lead to a heightened sense of affiliation with a firm. Established firms tend to be conservative and may need more material evidence to be convinced. Finally, smaller firms also require material evidence, but may find emotionally evocative messages appealing.

Evolving Roles in Ecosystems

Work on ecosystems has mostly articulated a structural perspective of value creation by focusing on how a focal firm and affiliated constituents create economic and technological complementarities (e.g., Adner, 2017). Our model provides a sociological explanation of how a peripheral firm improves its structural position beyond economic or technological means. Specifically, it architects a leadership position by changing its entrepreneurial vision (Dattée et al., 2018; Thomas & Ritala, 2022) to resonate with target audiences in an ecosystem. In our case, a peripheral complementor projected its role as an emancipator of unsatisfied users, a visionary partner of established firms seeking growth, and an orchestrator for fledgling firms in a derivative ecosystem without disrupting the original ecosystem into which it had wedged.

Studies of firms lacking valuable resources have often discussed “passive strategies,” with little agency ascribed to “resource-seekers” (Clough et al., 2018: 261). For example, in

explaining how suppliers move up the value curve (e.g., become OEMs), scholars tend to focus more on who they supply (buyers) rather than how well (supplier strategies) (Alcacer & Oxley, 2014). We have shown how a peripheral firm gains more agency by crafting compelling visions and taking commensurate substantive actions to proactively improve its structural position.

Finally, we show how a firm with mundane resources and greater dependencies on others need not pursue competitive substitution or a “winner-takes-all” approach to gain power in an ecosystem. Rather, it can follow a mutualistic approach, whereby the firm’s value proposition is compatible with the focal firm and its key complementors (Ansari, Garud & Kumaraswamy, 2016). Such an approach is founded on the “rising tide lifts all boats” principle, as the aspiring firm seeks not to disrupt but to add value for the focal firm in the primary ecosystem.

Our findings suggest that Xiaomi increased traffic for the focal player in the primary ecosystem while also enabling the rise of small companies as second-tier complementors in its own derivative ecosystem. Android’s market share soared from 43% in 2011 to a daunting 82% in 2022, and nearly 1 in 5 Android-based smartphones globally are produced by Xiaomi (Table 3). Thus, a start-up entrant can provide complementary value in non-overlapping market niches (symbiosis) but also can compete by entering overlapping market niches (commensalism) (Aldrich & Ruef, 2006). For example, Xiaomi makes TVs and Google does not, but Xiaomi’s smartphones and wearable devices compete with Google products. While the importance of value creation and partnerships in ecosystems is well-established, we suggest that success in such environments necessitates a shift from ego-centric competitiveness and disruption to a mutualistic and eco-centric approach. In essence, it calls for firms to prioritize not only their individual interests but also the collective needs and vitality of the broader ecosystem for mutually beneficial outcomes, and enhanced value creation for all participants.

In sum, while a start-up entrant is constrained by an established ecosystem's structure and rules of participation, it can still carve out a competitive position through crafting compelling visions and taking substantive actions that also end up expanding ecosystem boundaries.

Managerial Implications and Future Research

Our study has several managerial implications. Managers can focus on building a sense of community around its products and create a buzz by engaging with users through social media, forums, and events, and partnering with influencers. The idea is to make consumers feel like they are part of something “bigger” and significant. Early on, Apple embodied the alternative identity of the personal computing movement that opposed corporate computing led by IBM. It sought to enhance the personal autonomy of end-users by democratizing access to computers and turning “customers into fans” (Rao & Dutta, 2018: 313). Similarly, LEGO tapped into users' desires to share creative product design ideas. Firms can strive to develop not just customers, but fans or highly engaged users with a sense of affiliation and attachment to the firm.

Second, incubating small firms in exchange for a minority ownership stake is an alternative strategy for diversification and growth relative to typical models of corporate entrepreneurship (i.e., strategic alliances, JVs, M&As). While incubating has similarities with the use of Corporate Venture Capital (CVC), traditional CVC businesses invest in companies that either promise a financial return or a strengthening of the core business. Xiaomi's approach was a blend between seeking financial benefits (equity stake) and fostering strategic alignment (Tong, Guo, & Chen, 2021). This creates both equity and complementarity dependencies, reducing opportunism and placing reputational pressure on the collective. Yet, incubating and managing these firms requires navigating a delicate balance between control and autonomy.

Despite these contributions, our study has limitations that open future research avenues. Xiaomi joined Android's ecosystem during its emergent phase when Google was pursuing growth in China, and thus had more latitude to shape the ecosystem. Future studies can examine how start-ups can gain advantageous positions in mature ecosystems. Further, while the focus of our study is externally-oriented, i.e., the firm and its ecosystem, examining the internal microprocesses of how a start-up complementor develops integrative capabilities can be a fruitful future research avenue. Finally, whereas our study mainly considers a commercial ecosystem, in highly-regulated markets (e.g., aerospace), ecosystem development may be significantly influenced by government policies, especially in countries like China, where the government wields considerable influence. Future research can illuminate how firms navigate the institutional context, especially as they scale in size and scope, and their socio-economic and political influence becomes more visible and attracts greater scrutiny from the wider society.

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TABLES

TABLE 1. DATA CORPUS

Data types and dates		Amount/ location	Use in analysis
Primary data (2014–2023)	Semi-structured interviews	<ul style="list-style-type: none"> 90 semi-structured interviews with managers and employees of Xiaomi (n=40) and other Android ecosystem players, e.g., consumers (n=11), suppliers (n=16), OEMs (n=8), complementors (n=12) and industry analysts (n=3) (30–90 mins each; February 24, 2014–March 22, 2023) 22 follow-up interviews with Xiaomi ecosystem chain department (n=5), smartphone department (n=5), executive office (n=4), organization department (n=3) and other senior members (n=5) in Xiaomi in August 2021 and March 2022 	557 pages (Chinese transcription from recording) <ul style="list-style-type: none"> Understanding the context and background of the Chinese smartphone industry and the Android ecosystem Tracing and understanding Xiaomi's strategies, including strategizing and implementation Tracking the process of Xiaomi's entry into the Android ecosystem and creation of its derivative ecosystem Analyzing the interplay between ecosystem evolution and Xiaomi's strategy
	Participant observations	Visits to Xiaomi <ul style="list-style-type: none"> Headquarters (June 20, 2014; August 12, 2014; May 15, 2019; October 29, 2020; August 26, 2021; March 9, 2022) Head R&D Office (October 12, 2015; August 26, 2021) Customer Experience Stores (July 4, 2014; June 8–9, 2019; March 5–6, 2022; Feb 14–16, 2023) MIUI Beijing Club (June 21, 2014; August 16, 2014; August 11, 2020; March 8–9, 2022; February 15–17, 2023) 	18 visits (Beijing, and Shanghai, China) plus 1 offline and 1 online event <ul style="list-style-type: none"> Understanding Xiaomi's R&D, marketing, supply chain and ecosystem strategies over time. Identifying Xiaomi's approach to creating a derivative ecosystem and competing in the wider Android ecosystem Understanding customers' views on Xiaomi's products and how they participate in Xiaomi's derivative ecosystem
		Visits to competitors and ecosystem partners <ul style="list-style-type: none"> Huawei Headquarters (March 10–12, 2014; April 15–18, 2014; March 23–24, 2017) Huawei UK (August 7, 2015) Foxconn Shenzhen Base (June 6, 2016) Tencent Headquarters (July 19, 2016; March 29, 2017) OPPO Headquarters (March 31, 2017) 	8 visits (Shenzhen and Dongguan, China, Reading, UK) <ul style="list-style-type: none"> Understanding Xiaomi's local rivals and their opinions about Xiaomi and its derivative ecosystem Understanding the Android ecosystem from suppliers' and complementors' perspectives, how they interact with Xiaomi and why they participate in Xiaomi's derivative ecosystem Comparing first- and second-tier complementors in Android's ecosystem
		Focus groups <ul style="list-style-type: none"> Workshops and seminar on Xiaomi's ecosystem with academia and practitioners (October 2014; September 2015; December 2017; December 2019; February 2021; December 2022) 	6 meeting minutes (39 pages) and Q&A transcriptions (15 pages) <ul style="list-style-type: none"> Analysis of Xiaomi's strategies Elaborating the theorization of Xiaomi's story
Secondary data (2010–2023)	Documents from various sources	<ul style="list-style-type: none"> Related newspaper articles, industrial magazines, case studies, journal articles and monographs International and national industrial reports (from, e.g., IDC & Counterpoint; CCID & CAICT) Official websites and user forums Videos of interviews with Lei Jun 	2179 items <ul style="list-style-type: none"> Understanding the Chinese smartphone industry and Android ecosystem Understanding Xiaomi's general strategy, performance, and history Seeking background and key facts about Xiaomi's derivative ecosystem, business model, innovation, and consumer engagement from different perspectives
	Internal archives	<ul style="list-style-type: none"> Xiaomi annual reports (2018–2022) Internal presentations, brochures, fieldwork memo, biographies etc. 	1476 pages 93 items <ul style="list-style-type: none"> Systematic information and facts on Xiaomi's strategy, performance, and operation.

TABLE 2. DATA STRUCTURE AND ILLUSTRATIVE QUOTES

Theme	Category	Open codes and illustrative data
Phase I: Building a demand-side community by leveraging mundane resources	Challenge 1: High entry barriers in the ecosystem	<p>Differentiation based on superior supply-side capabilities</p> <ul style="list-style-type: none"> “Smartphones are more complex in production than any other consumer electronics. Although many [smartphone] components are modular, OEMs usually need unstandardized components to implement their designs of each model. For example, a screw spike can be unique [for each model]. These components need to be co-developed by both OEMs and respective suppliers. We have many employees working in the factories of our suppliers to co-develop [these components] with them.” (Xiaomi manufacturing manager, Interviewee #4, 2014) “A computer is fully modular with almost standardized components. For smartphones, [this] is not the case. You can find numerous examples of users that DIY their computers with high performance but almost none can DIY a smartphone with the same level of performance. Established firms have strong capabilities both in supply chain and related technologies.” (Industry analyst#1, Interviewee #3, 2014, 2015) <p>Developing a good operating system for a smartphone is highly technical</p> <ul style="list-style-type: none"> “We found that those established firms, such as Samsung, did not succeed in developing an operating system for smartphones alone. Even today [there are only two], Android and Apple, who dominate the smartphone operating system market. Therefore, we do not think developing our own operating system as a new entrant was a good option.” (Xiaomi software manager, Interviewee #5, 2014, 2016) “Developing a good operating system for smartphone is highly technical. Nokia, with strong capabilities in telecommunication and prior success in operating system for functional mobile phones, failed. Microsoft, with extraordinary capabilities in operating systems [for PCs], also failed. So, it is clear that start-ups [such as Xiaomi] with less technical resources could never try this.” (Xiaomi strategy manager, Interviewee #1, 2014)
	Opportunity 1: Underserved user niche	<p>Customizing Android-based interface for Chinese users</p> <ul style="list-style-type: none"> “[Around 2009], most well-performing Android operating systems were English-based. Chinese users could not use them until there was a Chinese version. At that time, a flashing Android phone was extremely popular among customers. Many small service teams lived on helping users to flash their phones. But these small teams could only translate them into Chinese and could not optimize operating systems, which left opportunities for us.” (Xiaomi software engineer, Interviewee #5, 2014, 2016) “Three factors determine a smartphone’s user experience—user interfaces, operating systems, and hardware. Most users do have knowledge on hardware nor the operating system. They can only perceive whether the user interface is convenient and nice-looking, and whether the operations in the interface are fast and smooth ... Hence, if you can develop a product with a user interface that imitates iOS as much as possible, you will win this emerging market [in China].” (Xiaomi marketing manager, Interviewee #9, 2015)
	Persuasive mechanism 1: Crafting an emancipatory vision around a foothold resource	<p>Microprocess 1(a): Cultivating a community of users to democratize innovation</p> <ul style="list-style-type: none"> “Besides the well-known online forums and social media, we also organize offline activities, such as Mi Fan Festival and Mi Fan Meetings, during which our co-founders will attend and communicate directly with all those fans attendees, in order to both understand our users and learn from them to develop better products satisfy them.” (Xiaomi hardware developer, Interviewee #10, 2015) “Xiaomi is good at promoting user innovations. For example, as a skin developer, on one hand, Xiaomi [online store] provides us beautiful skins to download, either for free or at a minimal cost. On the other hand, Xiaomi encourages us to develop skins ourselves by providing very easy-to-use development tools and easily accessible channels to post [the newly developed skins] onto Xiaomi’s online store. I very much enjoy sharing my ideas with other fans and received their rewarding.” (Mi Fans/skin developer, Interviewee #63, 2021) <p>Microprocess 1(b): Evoking emotions to generate a sense of affiliation</p> <ul style="list-style-type: none"> “I think Xiaomi has achieved Lei Jun’s claim that to make this Chinese brand premium and globally competitive, as from Mi 1 to Mi 11, the products of Xiaomi are truly exceptional in quality, design and user experience, and with unbelievable price. Thus, I always regard Xiaomi as the exemplar of Chinese manufacturing that represent excellence and international standard.” (Mi Fans, Interviewee #57, 2020) “[We adopt] a user-centric strategy in marketing. We do not waste money in traditional advertisement. Instead, we focus on users. We engage them [in different aspects of product development] and let them have a feeling of participation. Users are at the core of our Internet-based business model. We stand with our users, interact with them, understand them, and develop products for them. In this way, our users are satisfied with Xiaomi’s products and even will speak for us.” (Xiaomi marketing manager, Interviewee #21, 2016)
Phase II: Building	Challenge 2: Difficulty forming dyadic	<p>Lack of resources to create a supply chain</p> <ul style="list-style-type: none"> “When we decided to enter the smartphone market, our team did not have any experiences in hardware. We did not know that we have to co-develop components and co-invest in the development. For example, one of our metal frames [for] the smartphone body weighs only 19 grams but requires an

supply-side legitimacy without a track record	supplier relationships due to a lack of resources and legitimacy	<p>investment of over 1.9 billion [CNY, almost 276 million USD].” (Xiaomi senior manager, Interviewee #79, 2022)</p> <ul style="list-style-type: none"> “When Xiaomi was established, we had no foundation for smartphone, no manufacturing capacity, no idea or connections on component suppliers ... Even our boss knew nothing about the hardware of a smartphone. ... Assembling smartphone components is a very complex issue, as an insignificant change in positioning of one component can make another incompatible with the design.” (Xiaomi manufacturing manager, Interviewee #18, 2016) <p>Inability to convince suppliers to collaborate</p> <ul style="list-style-type: none"> “We had received too many rejections when we requested components directly from suppliers in our early time. No one knew us or trusted us. I had the experience that a supplier I had known for a long time, and [who] completely respected me when I was in the company prior to Xiaomi, rejected our request immediately.” (Archival data #414 - Xiaomi founder’s official biography, 2015) “We did not recognize Xiaomi initially. We have seen so many Shanzhai companies. They aimed very high [in the first order]. But, when we customized our products and supplied them, they did not perform as expected and even could not pay back our cost. We had to pay for all the cost. These lessons prevented us from [accepting] Xiaomi’s initial request.” (A component supplier, Interviewee #39, 2018)
Opportunity 2: High growth potential of the ecosystem		<p>Huge potential of Chinese smartphone market</p> <ul style="list-style-type: none"> “By 2010, there were more than 300 million Chinese mobile users. But smartphones sold in 2009 was only 20 million. And it is projected that the smartphone users in China would double in 2020. Following the transition to smartphones, it would be the biggest smartphone market in the world.” (Industry analyst #3, Interviewee #88, 2023) “In 2011, the size of Chinese smartphone market increased more than 100% and considering the huge number of consumers, the trend of fast growing is expected. Moreover, analysts suggest that most smartphones sold in Chinese market is low-to-medium end, with less than 2,500 CNY [around 360 USD].” (Xiaomi marketing manager, Interviewee #9, 2017) <p>Key actors wanted to increase their market share in China</p> <ul style="list-style-type: none"> “Our market share in smartphone chips was more than 40% worldwide but around 10% in China in early 2010s ... We need to collaborate with Chinese firms to tap this market with huge potential ... Xiaomi seemed very unusual due to its growing user base.” (Qualcomm employee, Interviewee #45, 2019)
Persuasive mechanism 2: Crafting a pioneering vision around material and social proof		<p>Microprocess 2(a): Leveraging demand-side support and taking substantive actions to establish supply-side legitimacy</p> <ul style="list-style-type: none"> “All I can say [to persuade suppliers] is that [they are] not [supplying] us; rather, [they are supplying] the 500,000 users of MIUI who are ready to become our customers ... In addition, to inform the user base, we also demonstrate our understanding of our customer needs to make [suppliers] believe in our business model.” (Former supply chain manager of Xiaomi, Interviewee #26, 2017) “Our smartphones are made of over 800 customized components from over 100 suppliers. We need to contact and visit them one by one ... Since a smartphone is tiny, a slight change in design can cause various problems. For example, to fit a new processor, we may need a bespoke battery, which may also affect [the functioning of] the antenna. In addition, OEMs’ welding techniques may determine the functioning of these chipsets ... So, we need not only to appoint specialized staff in suppliers’ factories but also to solve problems with multiple suppliers together.” (Xiaomi hardware manager, Interviewee #10, 2015) <p>Microprocess 2(b): Providing social proof from initial high-status connections</p> <ul style="list-style-type: none"> “Our outsourcing manufacturer helped us a lot in developing the smartphone supply chains ... Due to the prestige of our outsourcing manufacturer among those component suppliers, [the outsourcing manufacturer] helped us to access those suppliers easily ... Many suppliers have close relationship with [the outsourcing manufacturer], so when our outsourcing manufacturer asked them to support us, they no longer declined.” (Xiaomi hardware manager, Interviewee #10, 2015) “There are over 500 million monthly active users of MIUI now. Therefore, GetApps [Xiaomi App Store] serves as an important vehicle for national and international app distribution. Meanwhile, Xiaomi also launched a support program to help developers to capture value from GetApps, which makes it more attractive to developers.” (Xiaomi store developer, Interviewee #89, 2023)
Phase III: Creating a derivative ecosystem by orchestrating value creation	Challenge 3: Diminishing advantage due to increase in supply-side homogeneity	<p>Imitation by local rivals based on supply-side homogeneity</p> <ul style="list-style-type: none"> “[Local rivals] have learned Xiaomi’s cost-ratio approach which aims at providing the best possible technology integration with the lowest possible price ... more worrying, these competitors have their own advantages in collaborating with premium partners and implementing this approach, such as OPPO’s national market channel reach and Huawei’s exceptional telecom technologies, etc., which threatened Xiaomi’s competitive edge.” (Industrial Analyst #2, Interviewee #81, 2022) “Mr. Ren Zhengfei [Huawei’s founder] has studied Xiaomi since its success in 2013. Ren often appreciates Xiaomi’s approach where there are only end-customers and producers, without middlemen that increase the cost [to end customers].” (Former senior manager, Huawei Honor, Interviewee #76, 2021) <p>Extra supply cost due to lack of demand-side synergies</p>

	<ul style="list-style-type: none"> ◆ “Before the [ecosystem chain] department, we didn’t know that many shared components are priced differently for our various types of products, even [if] the supplier is the same one ... We realized it is essential to promote synergy among different products, so that we can become more powerful in bargaining with suppliers and can improve our operational efficiency.” (Xiaomi ecosystem chain employee, Interviewee #73, 2021) ◆ “We used to promote one generation of smartphones each year. This helps to achieve economies of scale and can also help contribute to reducing the cost of components. However, we, now, have a wide range of generations of smartphones with various brands, in order to respond the fast-growing and diverse demands. The coordination among different brands is limited, which increases the complexity of and decreases our competitiveness in our supply chain.” (Xiaomi supply chain manager, Interviewee #27, 2017)
Opportunity 3: Supply- and demand-side diversification	<p>Supply-side diversification</p> <ul style="list-style-type: none"> ◆ “A key advantage is based upon the increasing range of our ecosystem chain products that can increase the likelihood of common or similar components. If coordinated well, our supply cost can be decreased, as the order volume [of these components] increases.” (Xiaomi ecosystem chain manager, Interviewee #75, 2021) ◆ “With the ecosystem chain department, we can reinforce our relationships with existing suppliers. In addition, we can also explore new relationships with new suppliers, expanding our supplier portfolio. Once there is a new product, we can, efficiently both in time and cost, develop new supply chains accordingly.” (Xiaomi ecosystem chain manager, Interviewee #75, 2021) <p>Demand-side diversification</p> <ul style="list-style-type: none"> ◆ “It is very unlikely for a customer to buy smartphones a few times a year. So, if we only do [smartphone] business, our customers will have lower loyalty and a very low repurchase rate. So, when these customers [who have a smartphone already] do not have a need for smartphones, we need to provide a rich portfolio of products related to the usage of smartphones or to their everyday lives ... Of course, it is also risky, if we can’t maintain the quality of all these offerings to reach a very high level.” (Xiaomi senior manager, Interviewee #17, 2016) ◆ “Our smartphone enables us to develop a huge market base. Consumers in the market base actually have heterogeneous demands. They need smartphones, and other related products, such as apps, other smart devices and life-style products. Meanwhile, such products also increase our user base. For example, over 2/3 users of our Mi Home app are from non-Xiaomi smartphone users.” (Xiaomi senior manager, Interviewee #79, 2022)
Persuasive mechanism 3: Crafting an orchestrator vision around demand- and supply-side as material proof	<p>Microprocess 3(a): Incubating a community of fledgling firms</p> <ul style="list-style-type: none"> ◆ “We did a lot to provide the best user experience to our users by offering a portfolio of products. For example, to overcome [the] battery volume issue, a common smartphone problem, we incubated Zimi to develop our own power bank by integrating technologies from LG and Texas Instruments, which turned out to be a revolutionary product in that industry. When there was a need for wearables, we incubated Huami, a brand for wristbands that can be connected with Xiaomi smartphones.” (Xiaomi marketing manager, Interviewee #34, 2017) ◆ For these years, we have developed a huge user base. Honestly speaking, such a user base could enable any firm to boost. To tap the full potential of such a user base, we could satisfy user demands across different products in various industries. To make these products more competitive, our strategy is to nurture or support new complementors to join our ecosystem, providing them both the user base and technical support, such as industrial design. (Xiaomi marketing manager, Interviewee #9, 2017) <p>Microprocess 3(b): Evoking emotions to create resonance with second-tier complementors</p> <ul style="list-style-type: none"> ◆ “Although many suppliers and consumers buy into the patriotic sentiments that Xiaomi can revitalize Chinese manufacturing, such an effect on Chinese consumers can be only temporary and will not last long if we cannot offer competitive products. Actually, we attract consumers by offering various types of products in virtuous and sincere ways to make them confident in us and affected, which, in return, can increase their likelihood to buy [our] other products.” (Xiaomi marketing employee, Interviewee #41, 2018) ◆ “When developing complementary products, given the huge number of available choices in the market, we insist on sourcing most components from top-tier suppliers in their respective industries, exactly the same as those high-end products, which helps us to label our complementary products also as premium quality and high performance.” (Xiaomi supply chain employee, Interviewee #33, 2017) <p>Microprocess 3(c): Combining supply- and demand-side synergies to attract more prominent partners</p> <ul style="list-style-type: none"> ◆ “The development of Xiaomi [smart loudspeaker box] is due to our capabilities accumulated during the development of our ecosystem chain. We have ecosystem chain partners such as Bluetooth loudspeaker box and televisions, which laid our foundations of acoustic technology and developed our capabilities in related supply chains. We also have a former chief sound engineer from Philips ... So, when we realized that [having a] smart loudspeaker box [was] critical, we [could] quickly organize a team and efficiently design and deliver the product” (Xiaomi department of organization manager, Interviewee #80, 2022)

TABLE 3. GLOBAL SHIPMENTS OF SMARTPHONES, INCLUDING ANDROID AND XIAOMI DEVICES (IN MILLIONS)

Type	Year											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All smartphones	491.0	545.2	1009.6	1299.4	1430.00	1473.00	1472.00	1404.90	1371.00	1292.20	1354.80	1205.50
Android	237.8	375.1	793.5	1059.0	942.37	1057.47	1082.51	1055.92	1016.32	936.59	948.50	872.42
Xiaomi	0.3	7.19	18.7	61.1	66.60	58.00	91.40	118.70	124.60	146.40	190.30	150.50
Xiaomi market share	0.13%	1.92%	2.36%	5.77%	7.06%	5.48%	8.44%	11.24%	12.26%	15.63%	20.06%	17.25%

Sources: IDC market reports on smartphone shipments

TABLE 4. XIAOMI USERS AND FINANCIAL PERFORMANCE

Metric	Type	2016	2017	2018	2019	2020	2021	2022
Xiaomi user base (millions)	Smartphone ¹				309.6	396.3	508.9	582.1
	Complementary devices ²	-	51.5	150.9	234.8	324.8	434.0	589.4
	AI assistant (<i>Xiaoi tongxue</i>) ³	-	-	38.8	60.4	86.7	107.0	114.6
	Mi Home app ⁴	-	-	20.3	36.8	45.0	63.9	75.80
	Highly loyal user ⁵	-	-	2.31	4.1	6.2	8.8	11.6
Value capture from hardware (million CNY)	Revenue: Smartphones	48764	80564	113800	122095	152191	208869	130545
	Gross margin: Smartphones (%)	3.45	8.81	6.19	7.17	8.68	11.90	9.17
	Revenue: Ecosystem chain devices	12415	23448	43817	62088	67410	84980	58348
	Gross margin: Ecosystem-chain devices (%)	8.16	8.32	10.29	11.20	12.77	13.05	14.47
Value capture from software (million CNY)	Cumulative downloads from Mi Store (Billion)	75	120	~175	~290	~400		
	Revenue	3239.5	6537.8	9896.4	15955.6	19841.6	23755.3	28211.7
	Gross margin (%)	64.17	64.37	60.23	64.38	64.73	61.65	74.07
Xiaomi ecosystem chain investment (billion CNY)	Ecosystem chain partners ⁶ (number)	-	-	100+	290+	310+	390+	420+
	Book value of investment	-	-	-	30.0	48.0	60.3	63.9
	Return on investment, after tax	-	-	-	0.869	2.2	3.3	1.2

Source: Collated by authors from Xiaomi App Store Annual Report 2016–2017 and Xiaomi Annual Reports 2018–2022.

¹ The user base of Xiaomi smartphones is measured by the number of monthly active users of MIUI.

² The user base of complementary devices is measured by number of IoT and lifestyle devices connected to Xiaomi's AIoT platforms (excluding smartphones, tablets and laptops).

³ The user base of AI assistant (*Xiaoi tongxue*) is measured by the number of monthly active users.

⁴ The user base of Mi Home App is measured by the number of its monthly active users.

⁵ Loyal user base is measured by the number of users with five or more devices connected to our AIoT platforms (excluding smartphones, tablets and laptops).

⁶ The number of ecosystem chain partners is measured by the number of partners invested by Xiaomi.

TABLE 5. HOW XIAOMI ENROLLED KEY CONSTITUENTS IN THE ANDROID ECOSYSTEM AND ITS DERIVATIVE ECOSYSTEM

Phase	Constituent	Persuasion	Outcome	
Phase I: Building a demand-side community by leveraging mundane resources	Google (Focal firm of Android ecosystem)	Emancipating Android to fit the needs of Chinese users to support Google's competition with Apple	Xiaomi entered Android as a second-tier complementor	
	General users: Non-Xiaomi smartphone users	Emancipating users by offering a high-quality, customizable Android user experience to attract fans	Xiaomi created a community of users with a sense of affiliation	
	Mi fans: Non-Xiaomi smartphone users	Evoking emotions by interacting with users and responding quickly to their demands		
	Mi fans: Developers	Democratizing innovation by co-developing MIUI with fans based on their needs	Xiaomi created a community of users to democratize innovation	
	Mi fans: Testers	Democratizing innovation by co-testing with fans and respond to their feedback		
Phase II: Building supply-side legitimacy without a track record	Qualcomm (Key component supplier)	Leveraging Xiaomi's large user base and strategic vision to support Qualcomm's entry into the Chinese market	Gained supply-side legitimacy that enabled Xiaomi to form its supply chain and become a first-tier complementor	
	Sharp (Key component supplier)	Making substantive efforts to convince Sharp by expressing a determination to make better products for its user base		
	Inventec (ODM)	Expressing a shared vision to a company facing a transition and a shortage of orders		
	Desay (Peripheral component supplier)	Emphasizing connections with Qualcomm and Inventec		
	Foxconn (ODM/OEM)	Initially failing to establish a partnership due to lack of credibility as a newcomer		Triggered Xiaomi to consider alternative approaches to accessing suppliers
	China Unicom (Complementor)	Sharing the firm's vision and emphasizing a large user base as grounds for co-developing a customized version of MI 1		Gained supply-side legitimacy as sales of Xiaomi smartphones could be secured
Phase III: Creating a derivative ecosystem by orchestrating value creation	Mi fans: Xiaomi smartphone users	Organizing offline activities such as Mi Fan Clubs and annual Mi Fan Festivals to reinforce emotional affiliation	Continuously evoked "local pride" with Mi fans	
	Mi fans: General	Creating more complementary services or products to continuously evoke emotion and attract non-Xiaomi smartphone fans	Created demand-side synergy by combining existing fans and new fans attracted by other complementary products and services	
	Qualcomm (Key component supplier)	Emphasizing the opportunity to expand future business by co-developing chips for Xiaomi smartphones	Created supply-side synergy by consolidating component suppliers for various complementary devices	
	Foxconn (ODM/OEM)	Emphasizing opportunities to expand by opening new production lines and cooperating with other suppliers to improve productivity		
	Zimi (Complementor)	Offering to incubate a firm specialized in high performance and reasonably priced power banks	Incubated fledgling firms to create additional complementary products	
	miHoYo (Game developer)	Emphasizing a large user base and privileged commission rate to convince miHoYo to offer its globally popular game Genshin Impact exclusively in GetsApps	Created synergies between demand and supply sides, enabling Xiaomi to attract new and high quality complementors	

FIGURES

FIGURE 1. ILLUSTRATION OF THE ANDROID ECOSYSTEM PRIOR TO XIAOMI'S ENTRY

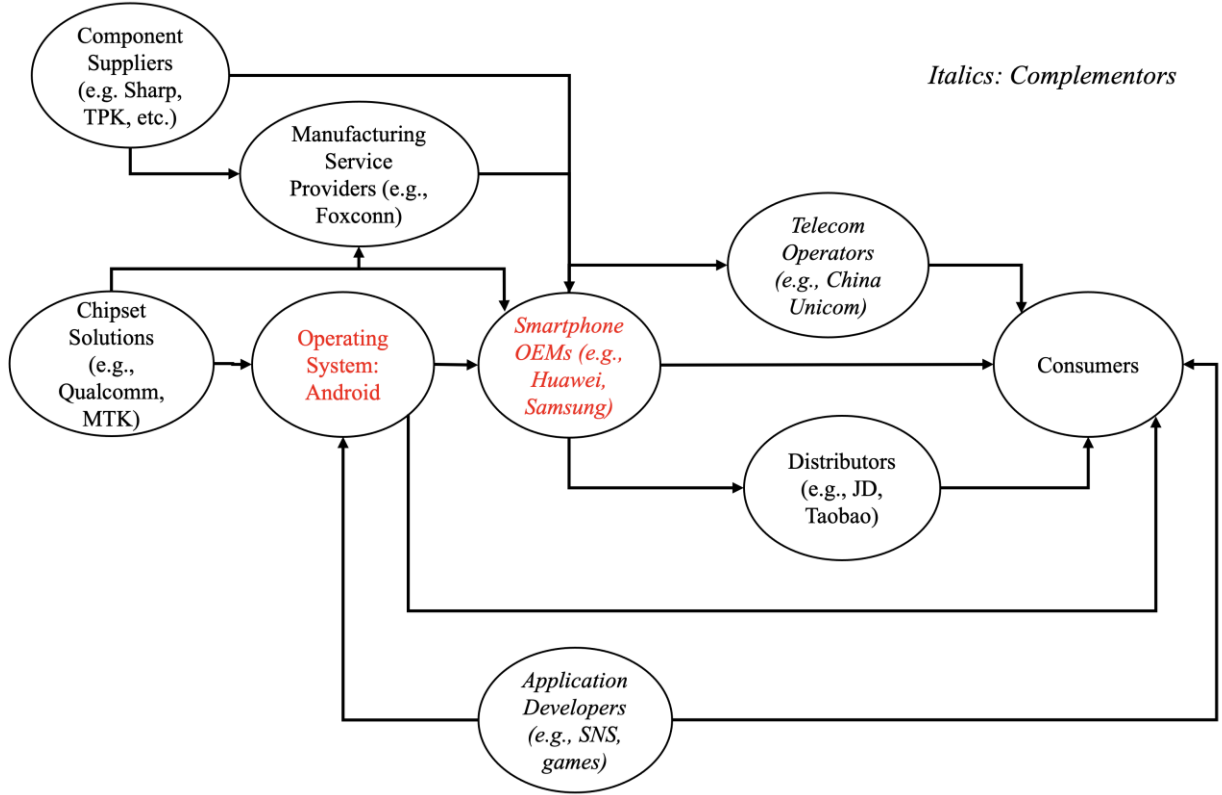


FIGURE 2. XIAOMI'S EVOLUTIONARY JOURNEY

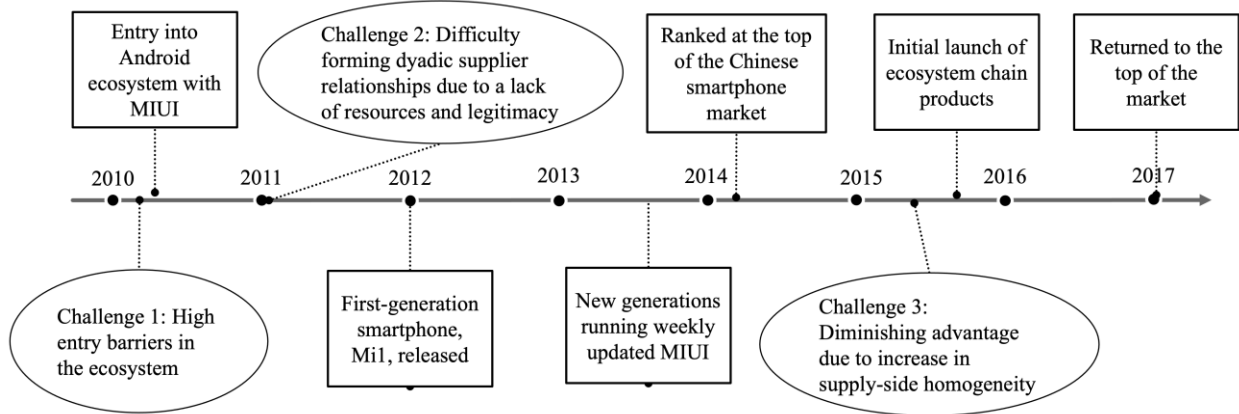


FIGURE 3. CO-EVOLUTION OF ANDROID'S ECOSYSTEM STRUCTURE AND XIAOMI'S STRATEGY

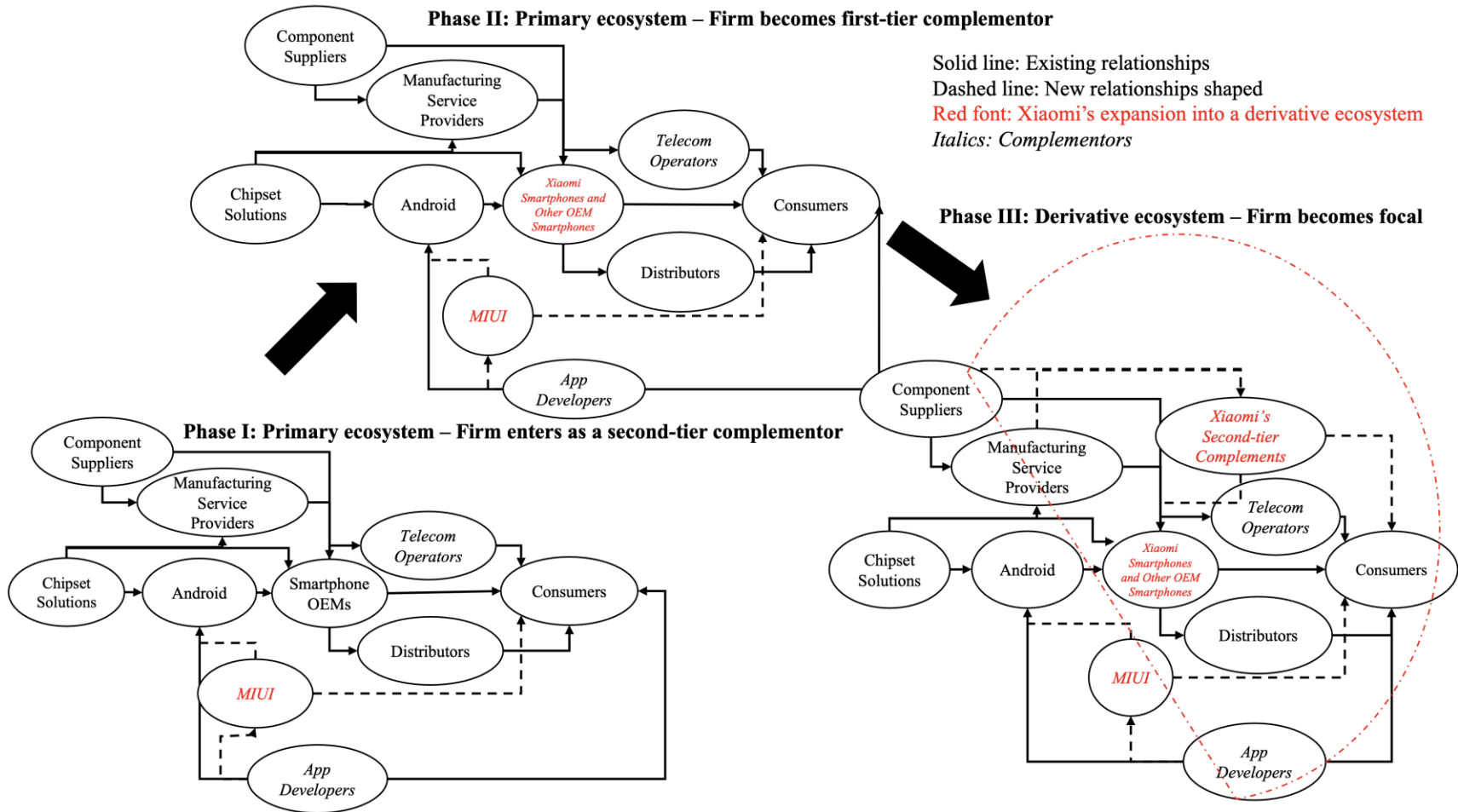
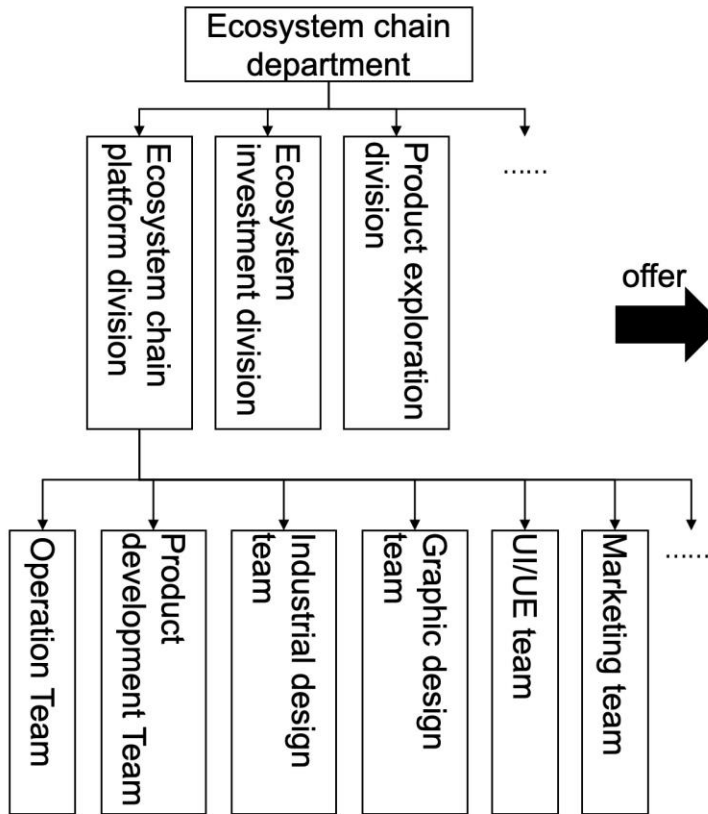


FIGURE 4. XIAOMI'S DERIVATIVE ECOSYSTEM AND ECOSYSTEM CHAIN DEPARTMENT

Organizational structure of Xiaomi's ecosystem chain department



Xiaomi's ecosystem chain
Xiaomi-invested partners (20-40% equity stake) *in italics*

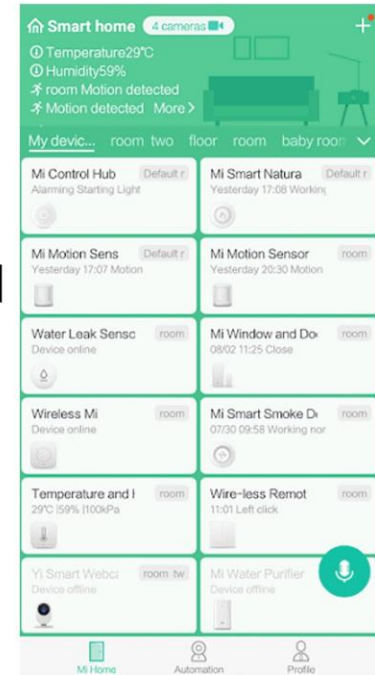


offer →

← control

Mi Home (App)

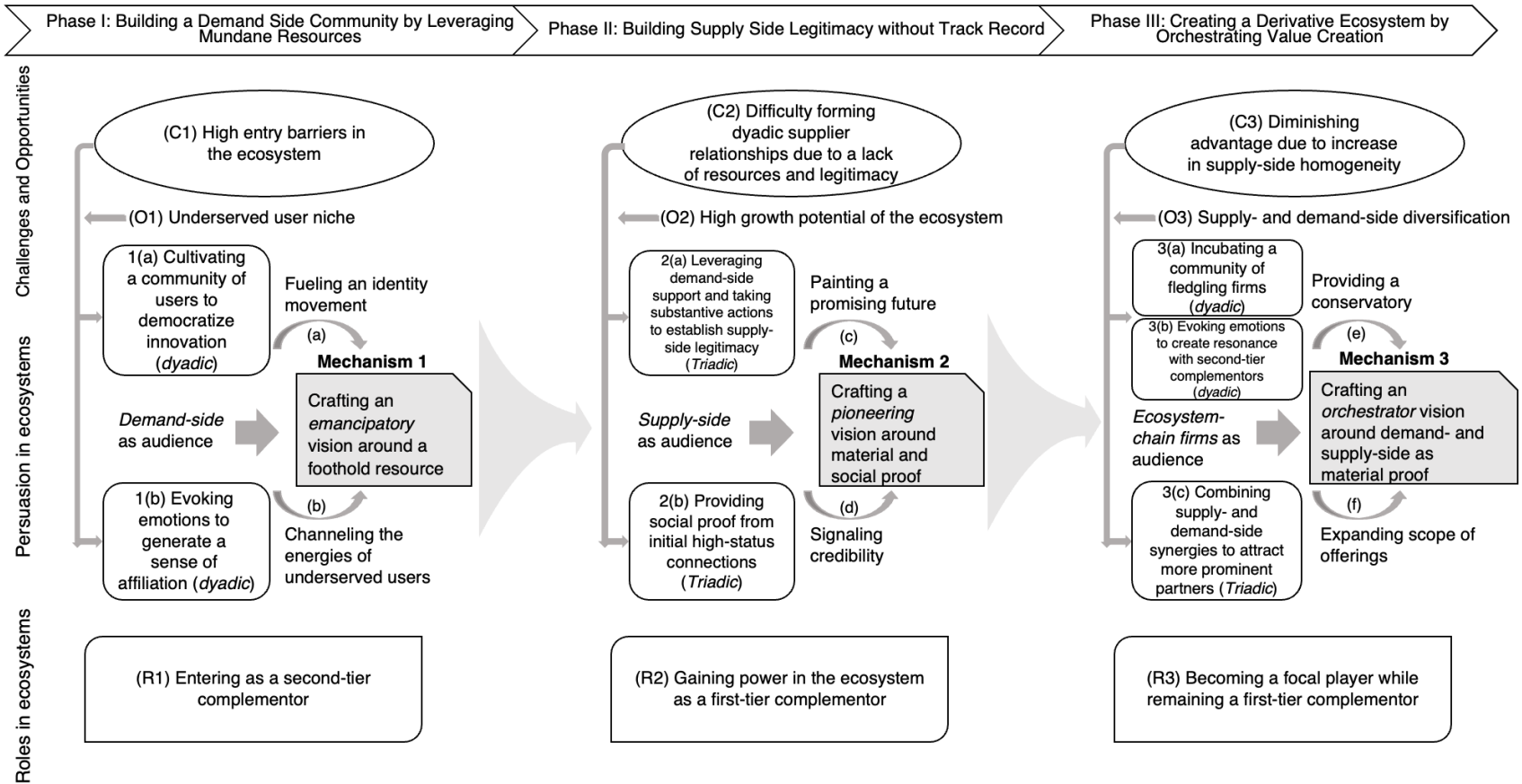
A panel to control all smart home devices (full functionality only available on Xiaomi smartphone)



(A snapshot from Mi Home Website)

FIGURE 5. PROCESS MODEL OF HOW RESOURCE-DISADVANTAGED FIRMS ARCHITECT ECOSYSTEM

LEADERSHIP



Xianwei Shi (xianwei.shi@sjtu.edu.cn) is an Assistant Professor of Management and Organizations at the Antai College of Economics and Management, Shanghai Jiao Tong University. He received his PhD from the University of Cambridge. His research examines dynamics, governance and cooperation within innovation and entrepreneurial ecosystems.

Xingkun Liang (lxk@pku.edu.cn) is an associate professor (with tenure) at the Department of Information Management, Peking University. He received his PhD from the Cambridge University Engineering Department. His research explores how firms operate and innovate in innovation ecosystems.

Shaz Ansari (s.ansari@jbs.cam.ac.uk) is Professor of strategy and innovation at Judge Business School, University of Cambridge. He serves on the editorial boards of ASQ, AMJ, AMR, SMJ, *Organization Science*, JMS, and *Organization Studies*, where he has also published. His research interests include examining the meaning and morality of technology and innovation management and social and environmental challenges through a variety of lenses (e.g., framing, institutional theory, social movements, identity and temporality).