Sharing Economy Platform Firms and Their Resource Orchestration Approaches in Emerging Markets

Abstract

Drawing upon key insights from the resource orchestration framework as a dynamic perspective on the resource-based view (RBV), we investigated the value creation dynamics found in sharing economy platform firms. By performing multiple-case analyses on platform firms operating in the sharing economy in China, we identified three main mechanisms by which sharing economy platform firms orchestrate their external resources (i.e., crowds of suppliers and consumers) to create value and gain a competitive advantage—constructing on-demand resource adaptation, building big-data-driven network effects, and enabling ecosystem resource coordination. We contribute to the emerging literature on the sharing economy while extending the RBV to the digital platform context, in which the value creation process is significantly shifted to beyond the boundaries of the firm.

Keywords: sharing economy platforms, value creation, resource-based view, resource orchestration, emerging markets, China

INTRODUCTION

The last few years have witnessed a remarkable increase in research aimed at comprehending the rise of sharing economy-based firms (Acquier *et al.*, 2017; Belk, 2014; Parente *et al.*, 2018; Zervas *et al.*, 2017). Enabled by digital technologies, many so-called 'sharing economy platforms' (SEPs) (Cockayne, 2016) have been established to provide peer-to-peer-based activities aimed at obtaining, giving, or sharing access to goods and services, coordinated through community-based online infrastructures. For this study, we defined SEPs as digital platforms in which the supply of capital and labour, coordinated through *peer-to-peer* transactions, is provided by decentralized *crowds* of individuals and small/independent businesses—i.e., consumers and suppliers (Gerwe & Silva, 2020; Sundararajan, 2016). A few examples of such platforms, among many others in various sectors, are Airbnb, Uber, TaskRabbit, Craigslist, and Venmo. Not only do SEPs match suppliers and consumers, but they also perform regulatory functions such as setting the entry rules and transaction mechanisms (Boudreau & Hagiu, 2009). Many start-ups have been emerging as SEPs, utilizing multi-sided intermediation to facilitate exchanges between consumers and suppliers, thus creating value within their ecosystems (Belk, 2014; Matzler *et al.*, 2015). However, despite the emerging studies on the sharing economy, we still lack an adequate understanding of the distinct characteristics of the platforms that operate in it and of their dynamics (Gerwe & Silva, 2020; Markman *et al.*, 2020).

As transaction platforms, SEPs function merely as intermediaries, matching crowds of suppliers and consumers. Their business model is different from that of the so-called innovation platforms (Cusumano *et al.*, 2019)—such as videogame consoles—which, besides enabling market interaction, provide the technological foundation for third-party firms (i.e., complementors) to launch and offer their products to the platforms' end-users. Accordingly, the launch of SEPs requires relatively low upfront costs, which typically imply low entry

barriers; whereas that of (technology-based) innovation platforms involves high upfront R&D and sunk costs to establish the technological foundation and shared assets for complementors (Constantinides *et al*., 2018). Unlike complementors, which need a certain level of co-specialization to the technological infrastructure (Cennamo *et al*., 2018; Tavalaei & Cennamo, 2020), SEP suppliers need minimal investment to participate in a sharing platform—sellers can also list themselves on multiple SEPs or switch easily between platforms; whereas *porting* a game from one platform to another is costly for publishers. Consequently, SEPs emerge mainly as young entrepreneurial firms that disrupt various established markets such as the transportation, hospitality, and financial sectors.

Moreover, even compared to other transaction platforms, SEPs possess essential peculiarities. As facilitators of peer-to-peer interaction among individuals and small or local businesses, the relationship and type of contracts that exist between SEP sponsors and platform participants differ from, for instance, those commonly involved in B2B platforms or payment cards, which with established and corporate suppliers. Suppliers in SEPs, such as the independent and small sellers in eBay or the freelancers in Upwork, do not enjoy distinctive brand equity or high status. Hence, SEPs do not benefit from marquee sellers (Eisenmann *et al*., 2006) or star participants (Binken & Stremersch, 2009) to attract consumers and solve the chicken-and-egg coordination problem to ignite and grow (Evans, 2009). Neither do they usually enjoy the option of exclusivity agreements (Cennamo & Santalo, 2013) with popular suppliers to differentiate themselves from other platforms. To grow in the market, SEPs depend heavily on a 'long tail' of almost homogeneous and decentralized participants, which require specific coordination and governance mechanisms.

To address these peculiarities, we integrated a theoretical approach based on an extended perspective of the resource-based view (RBV)—the resource orchestration framework (Sirmon *et al.*, 2007; Sirmon *et al.*, 2011). RBV scholars have long recognized the

importance of valuable, rare, non-substitutable, and difficult-to-imitate internal resources in driving the competitive advantage of a firm and creating value for customers (Barney, 1991; Grant, 1996; Peteraf, 1993). The resource orchestration framework suggests that the value creation and sustainability of competitive advantages for firms is not merely linked to the possession of *static* resources, but that the dynamic deployment and orchestration of resources by firms is also vitally important (Barney & Arikan, 2001; Barney *et al.*, 2011; Sirmon *et al.*, 2011). Still, this stream of research often emphasizes resources that are owned or controlled *internally* by a firm's supply network, and that managers can structure and bundle in order to develop capabilities and leverage them for value creation (Sirmon *et al.*, 2007; Sirmon *et al.*, 2011; Helfat *et al.*, 2007). The rise of digital platforms such as SEPs, however, leads to a novel interpretation of resources—those that drive the value creation of SEPs and are owned, exchanged, or appropriated among crowds of suppliers and consumers residing outside the firm boundaries. Yet, the existing research has not adequately examined the value creation dynamics in such platforms, particularly from an empirical point of view.

We sought to fill this theoretical void by identifying the primary mechanisms by which SEPs create value and gain a competitive advantage over their rivals. Specifically, we explored *how SEPs orchestrate their resources to create value and thrive in the market, while the value creation process depends substantially on crowds of small suppliers and consumers* (Bauer & Gegenhuber, 2015; Felin *et al.*, 2017). To answer this question, we performed multiple-case analyses of three Chinese SEPs from the transportation, food, and retail sectors. We chose China as our empirical context mainly for two reasons. First, with the development of mobile payment, internet technology, and infrastructure, China's sharing economy has been leaping forward in recent years. Due to the size of its sharing economy and to the extent of its engagement in penetrating all spheres of social life, understanding Chinese sharing economy platforms is a timely undertaking for both China and the world, with which it increasingly

engages. Second, China has particularly strong informal institutions embedded in the country's political and cultural heritage (Child & Tse, 2001). These, in turn, lend a distinct character to China's business environment and significantly shape the resource management of the country's sharing economy platform firms, from opportunity identification in the emerging economy to value creation and growth. This setting thus provides a valuable context for the investigation of our research question. Based on an inductive case analysis, we proposed constructing on-demand resource adaptation, building a big-data-driven network effect, and enabling ecosystem resource coordination as the primary resource orchestration mechanisms for SEPs to ignite, grow, and gain sustainable competitive advantage in the dynamic sharing economy market.

Our study contributes to the extant research in several ways. First, by looking inside the black box of SEPs' value creation dynamics, it makes significant contributions to the emerging research on SEPs, responding to the call for more studies on platforms operating in the sharing economy and on the way they strategize and compete in the market (Acquier *et al.*, 2017; Belk, 2014; Cheng, 2016; Gerwe & Silva, 2020; Stallkamp & Schotter, 2019). In their systematic review of platform studies, Rietveld and Schilling (2021) proposed more studies on platforms in those that are typically not considered high-tech industries as a fruitful line of research. By applying an inductive approach and closely investigating multiple SEPs in the transportation, food, and retail sectors operating in an emerging market—China—our study opened the 'black box' of value creation whereby SEPs obtain competitive advantage—i.e., constructing on-demand resource adaptation, building big-data-driven network effects, and enabling ecosystem resource coordination.

Second, our study makes significant contributions to the RBV. Digital transformation has resulted in the rise of a variety of new business models that are radically different from those of conventional businesses. Yet, we do not know enough about how the firms that are

part of the digital economy manage and leverage their resources and capabilities for value creation. These new business models have diminished the value of some of the erstwhile strategic resources of firms. Yet, the RBV, despite being one of the central theories of the firm, has not received sufficient attention in previous studies in explaining the new definition of *valuable resources* and the way firms operating in the digital context pursue competitive advantage by utilizing and managing their valuable resources. By providing complementary products, these complementors can 'invert' the platform—i.e., shift the innovation and production process outside of the platform firm's boundaries (Parker & Van Alstyne, 2016). That is, the main source of value is embedded within a broad network of external complementors and users (e.g., the suppliers and consumers in SEPs), rather than being in possession of the firm internally, as had previously been assumed. This new process of value creation and capture, along with the highly competitive environment of the digital era, prompts the reconsideration of the conventional RBV. Following the insightful, yet limited, studies on extending the RBV to the digital context (e.g., Gupta & George, 2016; Helfat & Raubitschek, 2018; Sun & Tse, 2009; Teece, 2017), we applied the resource orchestration framework, a *dynamic* extension of the RBV, to shed more light on how SEPs—a particular type of digital transaction platforms, as explained earlier—seek competitive advantage through the transformation of their resources into capabilities (cf. Sirmon et al., 2011).

We showed how SEPs can constantly pursue a much more integrative approach (Helfat & Raubitschek, 2018)—blending internal and external resources to guide their resource management actions—suited to orchestrate dynamic resources for value creation and to collaborate with a broader ecosystem of partners in order to drive the growth of the platform. We identified three processes by which SEPs gain such ecosystem advantage (Williamson & Meyer, 2012), all of which focus on curating the external participants of the SEP ecosystem and harnessing their power. Our findings highlight that, in the SEP setting, the internal

possession of superior static resources is not always as important as had previously been assumed. Instead, SEPs rely on the interaction among crowds of suppliers and consumers residing beyond the platform's organizational boundaries.

Furthermore, in line with previous studies highlighting the importance of big data for a firm's success (e.g., Akhtar *et al*., 2019; Dubey *et al*., 2019; Erevelles *et al*., 2016; Grover *et al*., 2018; Xu *et al*., 2016), we posited how, by driving network effects, big data are valuable, rare, non-substitutable, and difficult-to-imitate resources, in particular for digital transaction platforms such as SEPs. We showed that obtaining, absorbing, and analysing big data is a vital source of value creation and competitive advantage for SEPs.

Finally, besides the peculiarities of SEPs versus other platforms (Markman *et al*., 2020), as noted earlier, the empirical context of our study (Chinese SEPs) further highlights the identified mechanisms for SEP success. In particular, the need for the on-demand adaptation of a SEP's resources and coordination with its ecosystem participants become more vital in emerging economies. As Chen and Wang (2019, p.28) attested, "*the market environment for the sharing economy in emerging markets lacks the institutional basis found in developed markets, which creates unique consumer and firm problems.*" Notably, the trust-building role of SEPs in emerging markets is highly critical compared to that of their counterparts operating in developed markets. Gu et al. (2020) emphasized the essential issue of customer trust and risk perceptions in the Chinese sharing economy and their impact on SEP performance. In the uncertain and less formal environments found in emerging economies, the role of external partners (i.e., crowds of suppliers and consumers) and the way they perceive trust and risk is more vital (Chen & Wang, 2019). For instance, drawing on signalling theory, Jean et al. (2021) depicted the particular importance of buyer contact for those SEPs the suppliers of which are from markets with less-developed intermediary platforms. We added to the small but growing stream of research focussing on the sharing economy phenomenon in emerging economies,

where formal institutions are in a state of flux. By doing so, we demonstrated the resource orchestration approaches (e.g., how SEP managers in emerging markets bundle and structure the resources for capability building and value creation) of SEPs operating in weak institutional environments, such as those observed across emerging markets.

In the remainder of this paper, we review the theoretical background of SEPs and the resource orchestration framework. Then, we present an inductive multiple-case analysis performed to uncover patterns of value creation in SEPs and build our propositions. We conclude with a detailed discussion of the theoretical and practical implications of our study.

RESEARCH BACKGROUNDS

The sharing economy and SEPs

In recent years, the sharing economy concept has become a prominent phenomenon in both scholarly and popular media discussions (Belk, 2010; Botsman & Rogers, 2010; Mair & Reischauer, 2017). It has been loosely defined as the peer-to-peer sharing of access to underutilized goods and services, one that prioritizes utilization and accessibility over ownership (Schor & Fitzmaurice, 2015). We defined SEPs as digital platforms in which the supply of capital and labour, coordinated through peer-to-peer transactions, is provided by decentralized crowds of consumers and suppliers (Sundararajan, 2016). First, we emphasized the *peer-to-peer* exchange of goods and services; i.e., that the participants of SEPs are restricted to the "long tail" of individuals and/or small businesses. Second, although the exchanged goods and services can be offline, the interaction among suppliers and consumers is coordinated via *digital* SEPs. Hence, we embraced two features of SEPs common to all previous studies (as summarized by Gerwe & Silva, 2020) while relaxing temporary access, rather than ownership, and underutilized capacity assumptions. Following some previous studies (e.g., Mair & Reischauer, 2017; Schor, 2016), we therefore covered a broader range of SEPs. For example,

we considered eBay as a SEP, although the ownership of products is transferred to buyers, and the products are not slack capacity of sellers (unlike Airbnb, in which property owners *lease* their *empty* rooms to travellers).

Advancements in digital technologies have played a vital role in the development of the sharing economy; this is because suppliers and consumers are connected through (digital) multi-sided platforms across geographical boundaries; something that was not feasible under conventional (brick-and-mortar) business models (Muñoz & Cohen, 2017; Täuscher & Laudien, 2017; Matzler *et al.*, 2015. These digital platforms are the core elements of the sharing economy (Acquier *et al.*, 2017) and the essential infrastructure that drive sharing economy activities (Mair & Reischauer, 2017).

The platform ecosystem is a new form of inter-firm relationship, wherein a central firm (the platform sponsor) mediates between multiple groups of participants (e.g., buyers and sellers; or consumers and suppliers), through which it creates value within its ecosystem. Platforms can be categorized as transaction platforms (Cusumano *et al*., 2019), which are merely mediation channels or marketplaces between buyers and sellers, and innovation platforms, which, besides facilitating transactions, provide technological infrastructure for third-party complementors to develop their products and offer them to the platforms' users (Cusumano *et al*., 2019; Jacobides *et al*., 2018). Being an innovation or transaction platform is more a matter of degree than a dichotomous categorisation. Nevertheless, videogame consoles, smartphone app stores, and software operating systems are exemplars of innovation platforms; whereas online retail marketplaces, video streaming portals, and ridesharing platforms are closer to the transition end of the spectrum.

Platform participants, on the one hand, must abide by the platform rules and regulations—such as the entry rules, transaction fees, and quality requirements set by the

platform sponsors (Boudreau & Hagiu, 2009; Nambisan and Baron, 2013). On the other hand, they benefit from the value co-created within the ecosystems, which is not easily attainable beyond its boundaries. Suppliers, sellers, or complementors benefit from a common set of assets—such as technological and marketing resources—and from a pool of potential demand for their offerings. On the other side of the platform, consumers and buyers also access a variety of products along with platform instruments geared to guarantee the trustworthiness of the transactions and quality certificates of the products (e.g., user ratings and reviews).

A central characteristic of platform ecosystems is the existence of an (indirect) network effect between the participants on different sides of the platform—the value realized by the participants on one side of the platform depends on the number of those on the other side (Armstrong, 2006; Parker & Van Alstyne, 2005; Zeng *et al*., 2019). Accordingly, platforms face the classic chicken-and-egg problem (Caillaud & Jullien, 2001): they need to have enough participants on one side to attract those on the other side, and vice versa. As a result of such network effect, the larger the market share captured by the platform, the easier it becomes for it to win future market shares (Arthur, 1996). In ridesharing SEPs, for instance, the market has been mainly tipped in only a few platforms (i.e., Uber and Lyft): the combined market share of which, in the US, is around 99%[1]. Accordingly, incentivising firms and customers to join a platform and interact with each other to ignite the network effect is a vital role of the platform sponsor (McIntyre & Srinivasan, 2017).

SEPs, as transaction platforms, create value by channelling and organizing transactions or exchanges between consumers and suppliers, rather than producing or owning any products themselves (Chen *et al.*, 2018). This results in the establishment of wider connections and partnerships between firms and their customers in various sectors such as retailing, ridesharing,

[1] See https://www.statista.com/statistics/910704/market-share-of-rideshare-companies-united-states/

and hospitality. Thus, a new breed of ecosystems made up of numerous consumers and suppliers around SEPs has emerged and changed the nature of consumption patterns and competition across different types of firms (Belk, 2014; Matzler *et al.*, 2015). The dynamics of participation and value co-creation in SEPs, however, are significantly different from those found in innovation and many transaction platforms.

Joining SEPs does not require specific knowledge of platform technology, and the quality standards are often not very strict, in order to induce as many suppliers and consumers as possible to participate in the shared consumption (Kyprianou, 2018). Accordingly, the role played by *the crowds* (Felin *et al*., 2017) of participants, in this context, fundamentally changes the dynamics of the marketplace. Such crowds, which are the essential source of value creation within the platform, play a significantly different role compared to those of complementors and users of other (innovation) platforms (Scaraboto, 2015). In many cases, individuals are not only consumers in SEPs, but also goods and service suppliers (Bauer and Gegenhuber (2015). Hence, the pattern of coordination within SEPs and the strategies aimed at incentivizing individuals to share their labour and capital with other peers differ from those of other (transaction) platforms. Individuals are no longer passive product adopters; they become active and direct value providers.

Additionally, the up-front R&D cost linked to SEP launch is much lower than that involved in technology-based innovation platforms—such as PC operating systems and videogame consoles. Therefore, they face low entry barriers (Porter, 2001) and often possess easily imitable information-based capabilities and resources (Tan *et al*., 2015; Shapiro & Varian, 1999), which, in any case, are unlikely to be the main drivers of their competitive advantage (Parente *et al.*, 2018). The value creation processes, from inception, have thus dramatically shifted from within to beyond the firm boundaries.

Next, we look at the abovementioned unique characteristics of SEPs and at the value creation dynamics from the resource orchestration perspective.

Resource orchestration and SEPs

The RBV suggests that the development of a competitive advantage is fuelled primarily by a firm's underlying resources, and that the possession of rare, valuable, non-substitutable, and inimitable resources explains the differential performance of firms (Amit & Schoemaker, 1993; Barney, 1991; Barney *et al.*, 2011). However, scholars have questioned the static nature of the RBV and have highlighted that the mere possession of resources does not provide firms with competitive advantages (Chadwick *et al.*, 2015; Sirmon *et al.*, 2011). Notably, firms cannot know in advance how to leverage any resources they possess in order to develop competitive advantages (Hitt *et al.*, 2011; Ndofor *et al.*, 2011; Sirmon *et al.*, 2011).

The key argument of this line of research is that managers need to take on an active role in the deployment of resources and transform them into capabilities (Chadwick *et al.*, 2015; Ndofor *et al.*, 2015). Subsequently, scholars have noted that even firms possessing similar resources perform differently—an issue in regard to which the traditional RBV provides limited insights (Chadwick *et al.*, 2015; Helfat *et al.*, 2007; Sirmon *et al.*, 2011). This has led scholars to put forward a more dynamic framework; one that suggests that resources can only affect performance through the resource-based actions taken by managers to position their firms to compete effectively in dynamic environments (Hunt & Morgan, 1996; Ndofor *et al.*, 2011). Those studies that have adopted such a view have demonstrated that the managers' actions pertaining to resource deployment provide important insights suited to explain a firm's performance (Hitt *et al.*, 2011; Ndofor *et al.*, 2015; Sirmon *et al.*, 2007; Sirmon *et al.*, 2011).

Similarly, related studies have tried to shed light on how firms can develop sustainable competitive advantages: suggesting that the critical decision-makers' actions—the underlying

managerial measures through which firms configure and manage their vital resources—explain the development of the sustainable competitive advantages held by firms (Gruber *et al.*, 2010; Hitt *et al.*, 2011; Sirmon *et al.*, 2007). How firms access, configure and orchestrate their resources is essential in explaining their dynamic capabilities (Helfat & Peteraf, 2003; Helfat & Winter, 2011). Building on the RBV (Barney, 1991) and on the dynamic capabilities view (Teece, 2007; Teece *et al.*, 1997) in order to provide an integrated framework, Sirmon *et al.* (2011) put forward a resource orchestration framework (e.g., the structuring, bundling, and leveraging of resources) with asset orchestration (e.g., the search for and selection, configuration, and deployment of resources for value creation). This perspective has provided important insights into the processes by which firms can generate value and improve performance by better utilizing their resources (Chadwick *et al.*, 2015; Hitt *et al.*, 2011; Chirico *et al.*, 2011; Ndofor *et al.*, 2015). The resource orchestration framework provides managers with important directions to create and capture value and sustain their competitive advantages through the configuration of resources (Hitt *et al.*, 2011; Sirmon & Hitt, 2009).

The existing literature on resource orchestration often sheds much light on well-established conventional firms. Additional theory development is required to add richness to our understanding of how to orchestrate resources in new contexts (Helfat & Winter, 2011; Helfat *et al.*, 2007; Sirmon *et al.*, 2011). Most of the firms hitherto studied were conventional ones in which value creation was driven mainly by firm-level or supply chain resources. However, due to their unique characteristics, whereby value is substantially delivered and appropriated among external participants, understanding resource orchestration in SEPs will provide much-needed insights into how these firms create value within the sharing economy-led network of consumers and suppliers (Sundararajan, 2016). In the context of SEPs, these networks of suppliers and consumers often operate on an open and evolving basis and reside beyond the firms' boundaries. Such resource orchestration process is no longer linear (Moore,

1996) and centrally firm-led, but involves a community of geographically dispersed participants whose interactions drive the value of the platform's ecosystem (Coviello *et al*., 2017). To better understand the value creation process for SEPs, we performed an inductive analysis that, while building on the existing resource orchestration framework, delivered new analytical insights into how SEPs manage their resources to create value and gain competitive advantage.

RESEARCH DESIGN

Given the lack of prior theoretical and empirical underpinnings for the topic under study, we conducted inductive multiple exploratory qualitative case studies (Eisenhardt, 1989 Yin, 2013). Compared to single case studies, multiple case ones typically yield more robust explanations and satisfy theoretical purposes such as replication, extension of emerging theory, contrary replication, and elimination of alternative explanations among individual cases (Eisenhardt & Graebner, 2007; Yin, 2013). In addition, our multiple-case approach was in line with recent research on platform firms, which validated our adoption of it (cf. de Reuver *et al*., 2018).

In terms of sampling strategy, we selected three SEPs from the transportation, retail, and food sectors. To facilitate comparison, we supplemented those cases with three conventional high-tech firms, as explained below. An advantage of our sample was that it included two SEPs that had started at the same time (in 2013/2014) from a common position. Our additional sample SEP had been established around 2003. We identified three SEPs that had been founded over a limited period to narrow down the possible different institutional impacts upon these firms' strategies. This sample selection enabled us to control for environmental variation (Eisenhardt, 1989). With this case-selection approach, the specification of the sample population limited any extraneous variation. It clarified the domain of empirical findings in specific types of the business environment, thus offering rich

contextualized knowledge with a strong focus on theory (e.g., Tsang & Williams, 2012; Tsang, 2013). We also chose three conventional software firms in order to identify any differences in their value creation processes compared to those of our three sample SEPs. The founding times of these three firms were also consistent with those of our SEPs. We chose software firms to facilitate comparison for the following reasons. First, software industry firms are under constant pressure to develop new products due to continuous changes in technology, short product life cycles, and high demand for customized solutions (Li *et al.*, 2010; Giarratana & Fosfuri, 2007); this also applies to digital SEPs, which are characterized by unpredictable and volatile environments (Amit & Zott, 2001). Second, these firms' businesses significantly rely on in-house technology and know-how, which is in clear contrast to SEPs, where external suppliers and consumers play vital roles. This contrast enabled us to generate a richer and more generalizable understanding from our case analysis. Third, software firms, although they are not exactly multi-sided platforms, also exhibit network effects. The so-called *direct* network effect or increasing return to consumption occurs when the value a user derives from the consumption of a product increases with the number of other users consuming it (Katz & Shapiro, 1986). Table 1 describes our six cases, highlighting their founding details, domains of activities, and distribution of interviewees.

[Insert table 1 about here]

Each case served as a distinct experiment that stood on its own as an analytic unit (within-case analysis) (Eisenhardt & Graebner, 2007). Subsequently, by looking at the similarities and contrasts found in our cases (cross-case analysis), we were able to understand our single-case findings better, grounding them by specifying *how*, *where*, and—possibly—*why* our firms had carried on as they had. We were thus able to enhance the precision, validity, and stability of our empirical findings (Miles & Huberman, 1994). In our research, the firm was the unit of analysis.

Data collection

We utilized multiple sources of empirical evidence to capture both real-time and retrospective data in order to mitigate any bias and lead to robust research findings (Leonard-Barton, 1990). Our sources included: (1) semi-structured interviews; (2) case-related archival data—such as industrial statistics and reports, government publications, financial reports and strategic memos issued by the firms, public newsletters, press releases, firms' web pages, newspaper reports, as well as internet sources; and (3) emails, phone calls, and follow-up interviews conducted via Skype and WeChat to identify any emergent patterns and relationships in real-time and to fill any gaps in the accounts. This diverse range of lenses was designed to improve the likelihood of gaining a complete and accurate picture (Yin, 2013), provide textual accounts of debates and discussions, and strengthen confidence in our findings' accuracy (Jick, 1979).

Specifically, we conducted a total of 37 face-to-face interviews. Research access was negotiated through a personal contact who introduced the first author to the selected companies in April 2016. The interview process was carried out from July 2016 to September 2017. A snowball sampling technique was used to identify additional key executives or senior product managers who were one level below the CEOs/co-founders and hence sufficiently knowledgeable to provide relevant insights into this topic. We interviewed those managers, who were involved in strategic planning and execution, as they held key 'interpretational' positions (Bennis & Nanus, 1985; Smircich & Morgan, 1982) and had 'visibility' of the objects of inquiry (Pettigrew, 1990) with respect to the theme of resource orchestration. All the informants involved in this research held comparable positions and had at least six years' experience in the sample firms. Seven of them had been working for their firms since their founding. The multiple interview approach reduces any potential interviewee bias by enabling data to be triangulated across several sources (Miller *et al.*, 1997; Eisenhardt & Graebner, 2007). We conducted our face-to-face semi-structured interviews, which lasted between 60 and 150

minutes, in the Chinese language. Thirty-one interviews were recorded and transcribed verbatim within one week by professional service providers. The remaining six were not recorded either due to technical issues or because our informants withheld their consent for us to do so. Extensive notes were thus taken and documented both during and after these interviews.

During each interview and in order to increase data trustworthiness, the respondents were encouraged to provide concrete illustrations of the detailed actions based upon which SEPs create value with external resources (Eisenhardt & Graebner, 2007). The interview questions were generic in nature and were designed to expand the discussion to the end of obtaining relevant and factual information. The detail of the interview guide is included in Table 1. During the interviews, we avoided 'leading' through direct questioning in relation to specific constructs; instead, we focussed on facts and on the chronology of events; this helped reduce subject bias (Miller *et al.*, 1997; Bingham, 2005). If additional data were required for clarification, follow-up emails were sent, and additional Skype and WeChat interviews were conducted at later dates. The interview data were also triangulated with archival data, as specified above. To ensure the validity and reliability of our primary data in regard to our three emerging mechanisms (i.e., on-demand resource adaptation, big-data-driven network effect, and ecosystem coordination) and to consider the researchers' own roles in relation to theorizing about the processes observed, we triangulated our insights with secondary sources, including industrial statistics and reports, government publications, financial reports and strategic memos issued by the firms, public newsletters, press releases, firm web pages, newspaper reports, as well as internet sources (Eisenhardt, 1989).

Data analysis

As is typical in inductive multiple-case research (Eisenhardt, 1989), all of the interviews and archival data pertaining to a focal firm were synthesized into an individual case history that was later subjected to two types of analysis: within-case and cross-case. Our within-case analysis concentrated on the development of any generalizable constructs and unique patterns that might emerge for each firm. We proceeded iteratively with our data collection to better ground and thus improve the resultant theory. We triangulated data, emphasizing any themes supported by different data collection methods and confirmed by several informants (Jick, 1979).

We performed a cross-case analysis through a variety of lenses to look for the emergence of similar themes and constructs across multiple cases (Eisenhardt & Graebner, 2007). Although we took advantage of any opportunities to source unique data, we only began this cross-case analysis after most of the data had been collected in order to preserve the integrity of replication logic across cases (Eisenhardt, 1989; Yin, 2013). To facilitate the overall cross-case analysis, we made extensive use of charts, tables, and other cell designs to collectively compare categories (Miles & Huberman, 1994). Table 2 summarizes the process of theory development through the different stages of our data analysis

[Insert table 2 about here]

Once we had identified a possible framework, we re-examined the data's degree of fit with our emergent theoretical understanding (Becker, 1970; Glaser, 2004). We iteratively analysed our data by continuously revisiting their consistency with an emergent structure of theoretical arguments (Locke, 2001; Miles & Huberman, 1994). In Table 3, we provide a cross-case comparison and illustrated quotes.

[Insert table 3 about here]

FINDINGS

Through data and theory iterations, our emergent framework identified three key patterns of resource orchestration that SEPs apply to create value and gain competitive advantage. We will discuss these patterns next.

On-demand resource adaptation

The software business is driven by an increasing return to consumption (David, 1985). The more a software is adopted, the more experience is gained with it, and the more it is improved (Arthur, 1989). Thus, any software technology that achieves early adoption may eventually 'corner the market', with other technologies becoming locked out (Arthur, 1996). Although the upfront R&D cost is high, once a software is created, reproduction is much cheaper; therefore, the distribution and reproduction costs are low. Hence, the returns on the initial investment increase (Arthur, 1989; 1996; David, 1985). Such a view emphasizes the importance of any new technology designed and developed by a firm and of its adoption as key drivers of competitive advantage.

Yet, our data suggested that, in SEPs, although the platform architecture is designed and developed by the firm, the actual value is not produced within the firm, but from external participants. This differs radically from conventional high-tech firms, in which a considerable part of the value is created internally via access to technological innovation and knowledge development (Martín-de Castro, 2015). Furthermore, value can be generated for the SEP only if the suppliers and consumers interact and exchange with each other. Such prerequisite condition for SEP value creation poses several challenges: first, how to solve the chicken-and-egg coordination problem, and, second, how to encourage suppliers to keep offering their labour or capital to consumers. Managing growth is, in fact, a critical challenge for SEPs (Apte & Davis, 2019). We found evidence of a strategy focussed on on-demand resource adaptation to attract and encourage suppliers and consumers. In this context, resource adaptation involves

the constant and rapid iteration of gathering consumer feedback (including that provided by both suppliers and consumers), executing and experimenting through agile actions, and gathering feedback again to drive the next resource adaptation cycle. Such constant resource experimentation creates feedback loops and leads to the adjustment of a platform's internal resources, which, in turn, guides new experimentation to drive interaction between external suppliers and consumers.

One of our case firms—Socle—provided us with a compelling illustration of this pattern. After setting up a customer-to-customer e-commerce platform, Socle had struggled to attract customer attention (i.e., SEP participants on the supplier and consumer sides) in the market. To solve the coordination problem, Socle had encouraged its employees to find any items they may have had at home and were interested in selling, and to put them on the platform. The employees were also asked to act as buyers (i.e., the consumer side of the SEP) to quickly buy items they had put on themselves. Such actions gradually attracted external sellers (i.e., the supplier side of the SEP), who had put some items on the platform. As soon as this happened, Socle's employees would buy the items straight away. Once the participants' numbers had gradually built up, Socle's resource adaptation decisions had become heavily driven by a feedback loop. One respondent described this action as an on-demand service, in which Socle would spend significant time interacting with participants either by browsing the platform's 'customer discussion forum' or through A/B testing to understand the customer experience journey. By gathering this information, Socle had been able to constantly change and adapt its resources to improve customer experience. For example, after identifying an issue of distrust between buyers and sellers, Socle had not only changed its original business model to encourage offline interaction to finish the transaction but had also introduced a payment mechanism tailored to safeguard the interests of buyers. One informant reported,

> "*The mentality is no longer about us; the starting point is about them* [the customers]*; we constantly gather feedback, constantly make changes based on the feedback, then try it out again. It's like a continuous spiral loop."*

We observed very similar patterns in our other two cases—Du and Roan. Du, for example, was a Taxi platform, and its value was primarily driven by the scale and frequency of the market exchanges occurring between registered taxi drivers and taxi users. The outcomes of such exchanges depended on the actions of both the firm and its customers in a joint co-creation process. After setting up the platform, Du had invested significantly in marketing to promote its platform. One informant stated,

> "*We spent lots of money advertising our app, and we did lots of networking to convince taxi companies to use our app. But we forgot that the purpose of our app was to connect, to connect drivers and riders, how to make such connections better, how to provide the best customer experience for both sides. This mistake nearly killed us within two months.*"

Having realized its mistake, Du had changed its strategy from pushing for adoption in the market to initially creating a false demand to attract taxi drivers. For example, Du had hired 400 students on a daily basis and had given them 50 yuan to book taxi services through its platform. Following their rides, these students had been required to submit a short feedback report identifying any problems they had experienced while using Du's taxi service—e.g., if the pickup location had been convenient for them. Du had also interacted closely with the taxi drivers to understand any problems they may have encountered, and had used such information to continuously evolve its resources to drive the network effect. Such feedback had been quickly gathered by the product managers, who had promptly driven the changes and then gathered a new round of feedback. "*Short, horizontal and speedy*" action was often mentioned as the key mechanism to drive such on-demand resource adaptation.

Yet, the strategies adopted by Socle and Du were very different from those adopted by software firms such as Tog. China's rapid economic growth and social development, coupled with the extensive informatisation of both its public and private sectors, have increased

investment in the ICT industry, including network applications and development. After setting up a maintenance software firm in China, Tog had engaged in extensive marketing investments to promote its products. Such action was reflected heavily in the secondary data collected. The emphasis here is on SEPs investing in driving the network effect by solving a chicken-and-egg problem and streamlining the interaction between the two sides of the market (i.e., consumers and suppliers), whose active participation is the key driver of value creation. Conversely, traditional software firms focus on advertising their products to end customers, who are passive recipients of such adverts. For example, many of Tog's meeting minutes were found to be focussed mainly on the promotion of its developed software and on networking with relevant customers to promote sales. One informant stated,

> "*Our key customers are located in the banking, finance, and other government sectors; so, we had lots of marketing and networking to do, particularly for customers from the government and state-owned sector, they have lots of money to spend, so it's more about the socialization game*."

Many other informants from Tog echoed this view. The most significant initial investment, according to our informants, stemmed not from the technological cost but, rather, from the marketing and promotion ones. Similar patterns applied to the Coe and Altima case firms, both of which had adopted similar strategies for market adaptation.

Why does on-demand resource adaptation work well in the context of SEPs? One explanation is related to their unique value creation process. One of the main criticisms levelled at the existing RBV is that the value of a firm's resources is exogenously determined (e.g., Kraaijenbrink *et al.*, 2010; Lockett *et al.*, 2009; Priem & Butler, 2001; Priem *et al.*, 2013). In the SEPs' case, the value creation of a firm is also exogenously determined and delivered among a network of consumers and suppliers. Therefore, the RBV and existing discussions on stand-alone inward-looking resource management are no longer adequate to offer a robust and actionable understanding of strategic management (Arend & Lévesque, 2010; Priem *et al.*,

2013). According to our data, as the value creation process has shifted from a firm's internal resources to its external ones, the SEPs' position needs to follow suit, focussing on the continual gathering of feedback from external resources to guide internal resource experimentations, which will enable them to constantly adapt to market changes. Such reverse-balance attention—driven not by a firm's internal resources but by its external ones—requires SEPs to integrate both sides of their resources in order to generate the knowledge needed to guide resource deployment. As a platform's value is heavily based on the product and services provided by external suppliers and on the quality of the interaction between consumers and suppliers, SEPs need to constantly screen their suppliers and connect them to the right consumers. (Apte & Davis, 2019). We argued that such on-demand resource adaptation is critical to resolving the *exogenous value determination and delivery* problem in the SEP context.

By contrast, in line with the well-established deterministic account of a firm's internal resources, software firms use them as the primary driving force to generate competitive advantages. The resource orchestration process in SEPs is a dynamic and fluid process in which the resource management starting point is driven by consumers and suppliers residing beyond the firms' boundaries. Therefore, the value creation of SEPs is mainly dependent on their ability to engage in on-demand resource adaptation, rather than on exploiting internal R&D capabilities and resources. This led to our first proposition:

Proposition 1. *SEP value creation will be driven by on-demand resource adaptation, whereby SEPs constantly update their resources based on their participants' (i.e., consumers and suppliers) feedback loops to improve their external network coordination.*

The big-data-driven network effect

The existing literature offers a descriptive account of firms needing to effectively accumulate, combine, and exploit resources to *realize* value creation (Grant, 1991; Sirmon & Hitt, 2003). Sirmon *et al*. (2007) further proposed that the comprehensive process whereby a firm *structures*, *bundles*, and *leverages* its resources constitutes the crucial process of resource orchestration. Many scholars have explicated this argument by claiming that a firm needs to develop tight appropriability (Teece, 1986) by creating an isolating mechanism (Rumelt, 1984) or resource-position barriers (Wernerfelt, 1984) that prevent external access to its valuable resources (Barney, 1991; Peteraf & Barney, 2003).

This stream of theoretical development works well for conventional firms; however, for SEPs—the value of which is externally produced and determined—the critical question revolves around what rare, difficult-to-imitate, non-substitutable, and valuable internal resources can be used as the main driving force for value creation and competitive advantage. According to our findings, such resources are big data. Our analyses indicate that some SEPs adopt on-demand resource adaptation to build large networks of participants. The purpose of such network enhancement is not only to drive the network effect, but also to collect a large volume of data, including real-time ones. The sheer volume of a large network and the data collected from the online behaviours of participants enables machine learning algorithms to run billions of iterations on a daily basis and thus provide better experiences for consumers and suppliers. The results can be continuously improved as the volume and diversity of data increases and can then further improve participant experience, thus enticing more participants to join the network. In turn, more participation will enable SEPs to gather more feedback and further improve their existing algorithms. According to our findings, such a data-driven network effect acts as a catalyst to boost the value creation of SEPs. Our SEP cases drove value through big data and used the insights thus generated to improve the design of new products, services, and novel business models. Also, big data enabled these platforms to efficiently

engage with consumers and suppliers to further enhance their design and innovation processes, enabling them to create value within their ecosystems.

Roan, for example, had set up a platform aimed at connecting consumers with local merchants offering takeaway food. When its platform had been set up, over 200 similar platforms had already been active in the market. We noted that Roan's priority had been to rapidly build a large customer base, rather than to focus on generating profit. In order to do so, Roan had put a great deal of effort into gathering funds to support its operation. This was described as the '*money burning game*'. One informant reported,

> "*Initially, all of our attention was focused on building a large pool of customers; the growth had to be steady and sustainable. When we went to see the potential investors, they were not interested in how much money we could make now; they were interested in how quickly we could scale up and how we could sustain the* [customer] *number growth*."

Such a large customer base had generated a significant volume of data, which had enabled Roan not only to drive the network effect but also to gather more in-depth and holistic information about its customers. For example, the time and frequency of the customers' purchasing behaviours and their geographic locations could provide more accurate forecasting information for restaurants and delivery companies, which could contribute significantly to Roan's platform utilization and to the efficiency of its supplier side. Such data, according to our informants, had fuelled the network effect of the platform.

We observed a similar pattern in Socle and Du. For example, When Socle had been established, it had offered a free business model aimed at encouraging buyers and sellers to use its website. It had further strengthened its platform infrastructure, which used tools and mechanisms to stimulate network interaction. To sustain network growth, Socle had been proactively searching for funds to aggressively increase its number of platform participants. Our secondary data confirmed this action. Many meetings had been centred on "*how to reach*

the magic number [customer number] *in order to set off the chemical reaction* [of the customer data]." Such 'chemical reaction' can only occur in the presence of quantities of data large enough to shape the machine learning techniques and algorithms suited to drive the network effect further. One informant explained,

> "*Our key job is to drive platform interaction and coordination, to provide better matches for our sellers and buyers. We need to deliver constantly revised and relevant information to our customers, so that interaction and coordination are quicker, smoother, and more efficient. This all down to big data.*"

These data, collected from a significant number of customers over the years, can exert a predictor power suited to guide a platform and its partner's activities. One informant commented,

> "*With historical and real-time data, we can constantly tweak our algorithm to improve customer experience. Without them, it would simply be impossible for us to achieve such complex external network coordination*."

Conversely, Tog, Coe, and Atima expressed limited concerns with big data. One informant explained, "*It's all about our sales power and after customer service care*." Why are big data the primary resource driving value creation for SEPs? One explanation is that SEPs are vulnerable to losing their competitive advantage due to low entry barriers, easily imitable information-based capabilities and resources (Shapiro & Varian, 1999; Zeng & Glaister, 2016), consumers and suppliers empowered by the low switching costs, more substitute services, and reduced market information asymmetry (Singh & Kundu, 2002). The one vital resource that is valuable and difficult-to-imitate is the volume of data collected from a platform's established large network of suppliers and consumers. Such significant volume of data can be transformed by a set of machine learning algorithms—such as artificial intelligence—to drive network coordination, which further stimulates the network effect. One of our informants referred to this as "*the invisible driving force that stimulates platform growth*." For example, building a critical participant mass drives the data volume; the more data a platform collects from them,

the smarter it becomes (e.g., by providing recommendations, predications, and personalization) and the likelier it is to attract participants, and so forth. Such a big-data-driven network effect was emphasized many times by our informants as a great defence mechanism suited to prevent other platforms from serving customers at least equally as well.

The data-driven network effect occurs when the existing service can be continuously updated and improved by new participant-generated data, which enables it to entice more consumers and suppliers to join the platform. This, in turn, enhances the general (indirect) network effect between suppliers and consumers and works as a feedback loop to enlarge the size of the network. Hence, the data-driven network effect, tightly coupled with the indirect network effect—both of which are embedded within a SEP's network of participants—can become a source of competitive advantage by creating isolation mechanisms that protect it from imitation and preserve its rent streams (Rumelt, 1984). This dynamic and real-time data set represents the consumers' and suppliers' different needs and characteristics in the market; hence, it helps determine and generate resource value within the SEP's strategy frameworks, therefore complementing the existing RBV and resource orchestration perspective.

This led to our second proposition:

Proposition 2. *Big-data-driven management, whereby SEPs collect and analyse significant volumes of data drawn from their networks of participants (i.e., consumers and suppliers) to improve external network coordination, drives their value creation.*

Ecosystem resource coordination

The prior literature reflected the deeply engrained belief that innovation is a constitutive element of competition (e.g., Schumpeter, 1982; Davidsson, 2004; Lumpkin & Dess, 1996), and that competition can force platform firms to change their scope (Eisenmann *et al.*, 2011). To be successful in business, high-tech firms need to continuously introduce new technologies.

As Garud and Kumaraswamy (1993) pointed out, those firms that are more agile than their competitors in bringing out an endless succession of software and hardware products will be more likely to dominate the market. Diverging from the existing research, we noted that, rather than investing in R&D to continually innovate at the product/service level, SEPs orchestrate an ecosystem of players—such as suppliers, consumers, logistics providers, governments, and local communities—that come together to drive innovation at the network level. This resonates with those scholars who used ecosystems to explain that those firms that collaborate with their external partners and communities are more likely to sustain their competitive advantages (Adner, 2017; Gawer, 2014; Williamson & Meyer, 2012). Such ecosystem resource coordination enables firms to identify and experiment with new combinations of heretofore unconnected or less connected resources in more extensive networks.

Our Socle SEP case provided an excellent example to illustrate this pattern. In customer-to-customer e-commerce platforms, the coordination between suppliers and consumers is not only influenced by their online interaction but also by their offline one. For example, online transactions require offline logistic providers to deliver the products. Many service providers have organically emerged as a result of identifying the gap over the platform. For example, people with photography skills offer their services to help sellers to take photographs of the items they wish to sell; independent software developers help sellers to customize their online store appearance and manage their online business, professional and amateur models of different sizes and styles make a living by modelling for sellers over platforms. As consumer numbers increase, the demand diversifies and becomes complex. The emphasis here is not on a firm's ability to own and control resources to drive innovation but, instead, on its ability to mobilize, access, and coordinate external resources to drive innovation.

Similar patterns could be applied to our other two firms. For example, our informants from Du regularly highlighted demand-centred problem-driven innovation. This was described by one of our informants as follows,

> "*We constantly fine-tune our platform in order to provide better customer service. But what we can offer is limited, so how can we make ourselves relevant to others so they can also be using our service, not just for a taxi, but for any kind of transportation and movement?*"

Looking at meeting minutes, we noted that the discussion had been centred on how to improve the customer experience in different contexts with different partners and how to connect with other parties to introduce various services to both drivers and passengers. The innovation mentality had clearly shifted from a firm- to a network-centred one. One informant explained,

> "*The demand for the car service surged after we had reached a certain number* [of customers]. *This provided a perfect entrance for our online to offline* [O2O] *service where we can connect many O2O firms, insurance companies, car maintenance services, and rental services. The opportunities are endless*."

Such opportunities create an ecosystem that requires external partners to work together to deliver a holistic customer service. For example, Du had further worked closely with many leading universities, local traffic control departments, environmental agencies, and other cloud service developers to build a smart city. One informant explained, "*Once you take a step back and bring society in, you will find a thousand more opportunities to do business*."

By contrast, the software firms had adopted a product-centred innovation approach. For example, Atima had started providing unique solutions to help companies leverage critical data. However, after four months of slow sales, they had soon realized that their customers had almost no engineering skills, which, in turn, was stopping them from exploiting the innovative technology deployed in their software. To satisfy this distinctive need of its potential customers, the firm had quickly developed and enacted a novel plan by refining its business model and

adjusting its remit from simply providing solutions to delivering customized and user-friendly system solutions. One informant noted, "*Innovation is key, especially when you are new, you are fully exposed to the market, you need to have the ability to innovate your product and business model to get ahead.*"

Why is mobilizing, accessing, and coordinating external network resources to drive innovation crucial for SEPs? Due to its unique value co-creation process (Ceccagnoli *et al*., 2012), a platform is not a self-contained entity; therefore, its value creation depends on its ability to establish and maintain reciprocal relationships with all external partners (even beyond suppliers and consumers). As the network grows, more partners become involved in the platform ecosystem. Such diverse network interaction provides opportunities whereby innovative business models can emerge (Garud & Van de Ven, 1989, 1992; Garud *et al.*, 2008) and draw on previously unconnected and less connected network resources to drive novel resource configuration and value creation (Amit & Han, 2017). For instance, it has been shown that, when Uber cannot fully tackle the problems arising from local regulatory environments, drivers may provide supplementary solutions that help the SEPs' ecosystem to survive (Karanović *et al*., 2020). By curating and orchestrating their ecosystems, SEPs can harness their power and enhance value co-creation within them. Such ecosystem advantage (Williamson & De Meyer, 2012), which is rooted in the coordination of an interconnected crowd of participants and partners beyond the organizational boundaries, differs fundamentally from the advantages rooted in the *ownership* of valuable assets, knowledge, or employees, which mainly reside inside a firm's boundaries.

This resource orchestration strategy bears testimony to a system of thinking that resets the boundaries of capitalist systems, optimizing short-term financial performance while missing the most critical customer needs and the broader influences that determine their long-term success and continuous improvement. By coordinating, enabling, and synergizing partner

networks to grow and prosper, shared-fate networking greatly resembles the unique features of ecosystems (Iansiti & Levien, 2004; Moore, 1993, 1996; Mars *et al.*, 2012; Clarysse *et al.*, 2014).

Another explanation is that ecosystem interaction further stimulates data growth. As one informant illustrated, "*Broad and diverse network interaction boosts our data volume and gives us a much clear indication about what tools and mechanism we need to provide in order to make it work*." Such connectivity enables a platform to enter a new stage of development, powered by the explosive growth of data and interconnected data networks. The data-driven network effect then occurs on a much broader ecosystem scale and leads to the creation of new market opportunities. This led to our last proposition:

Proposition 3. *The value creation of SEPs is driven by ecosystem resource coordination, whereby they mobilize, access, and coordinate external resources to create new market opportunities and drive the data network effect on an ecosystem scale.*

DISCUSSION AND CONCLUSIONS

Our study was aimed at examining the value creation process of sharing economy-based firms operating in emerging markets. Its findings suggest that the primary source of value creation for SEPs is not driven by the core technology or know-how generated through 'high upfront R&D costs', but by the cost linked to attracting large numbers of external individuals and/or small businesses to interact via the platform. Therefore, we argued that, for SEPs, the high upfront costs are not linked to the technology *per se* but to the need to solve the chicken-and-egg problem of building their initial consumers and supplier bases, without which the platforms have minimal stand-alone value. This problem can be solved through on-demand resource adaptation. Our results emphasize the importance of big data as a vital internal resource—collected from a large network of participants—that is difficult-to-imitate and valuable and acts

as a vital driving force to create platform value. We also noted that, to sustain their value creation, SEPs broaden the scope of their collaborative partners to include suppliers, consumers, logistics providers, local communities, and even government agencies, which can yield many more opportunities to create new markets. As a result, SEPs can appropriate returns by coordinating the wider ecosystem's resources. Such broader network interaction can generate more data, which creates an additional reinforcing mechanism suited to drive platform growth. Figure 1 presents our model to illustrate the three mechanisms that emerged from our analyses.

[**Insert figure 1 about here.**]

Our paper makes significant contributions to both theory and practice, as follows.

Theoretical implications

First, our study provides a better understanding of the value creation process adopted by SEPs; a set of firms that, so far, have received emerging attention in management studies. Despite the vast and growing body of research on the competitive strategies of transaction and innovation platforms (e.g., smartphones, videogame consoles, online retailers, and credit cards), most studies on various aspects of digital platforms have hitherto failed to pay particular attention to SEPs and their nuanced business models, compared to other kinds of platforms. We know little about how SEPs, given their specific settings and relationships with their platform participants, grow and succeed in the market (Gerwe & Silva, 2020). Contributing and extending platform research (Gawer, 2014; McIntyre & Srinivasan, 2017; McIntyre & Subramaniam, 2009; Rietveld & Schilling, 2021), we focussed specifically on the sources of value creation in SEPs. We identified specific patterns of value creation activities and thereby provided clues in regard to how SEPs gain a sustainable competitive advantage. Responding to calls for more studies on sharing economy platforms (Acquier *et al.*, 2017; Belk, 2014; Cheng, 2016; McIntyre & Srinivasan, 2017; Parente *et al.*, 2018), we opened the 'black box' of the practices that drive

value creation in SEPs. Our findings are based on the specific strategic resource orchestration actions undertaken by SEPs, which rest on the nuances of blending external and internal resources. We showed how, rather than focussing on internal resource management, SEPs overwhelmingly pursue externally driven resource orchestration for value creation.

In addition to constantly engaging with and orchestrating the main drivers of value for the platform—crowds of consumers and suppliers external to the traditional boundaries of firms—we also highlighted the role played by big data as a prime internal SEP resource (Erevelles *et al*., 2016; Sena *et al*., 2019; Xu *et al*., 2016). Such resource shares characteristics with the (indirect) network effect—which we called the '*data-driven network effect*'—that enables firms to coordinate open and evolving external network interactions. The data collected from platform ecosystem participants are *valuable* because they drive platform Artificial intelligence (AI) capabilities; i.e., "*the ability of a platform to learn from data to continuously improve its products or services for each user, gives rise to new platform externalities, where a user's utility of a platform is a function of the scale of data-driven learning and improvements realized with AI*" (Gregory *et al*., 2020: p5). Such AI and data analytic (Dubey *et al*., 2019) capabilities can generate better and more tailored user experiences, improve a platform's transaction efficiency and coordination, predict possible consumer behaviours, and even shape the attitudes, expectations, and emotional reactions of users. Such volume and diversity of data and its associated AI and analytics capabilities are therefore rare, difficult-to-imitate, and valuable resources.

Real-time insights into consumer experiences and expectations, which can be a *rare* and *non-substitutable* resource, work as an input in the on-demand resource adaptation process. An extensive network of participants generates real-time and holistic data embedded within the ecosystems of SEPs, which enable them to provide better experiences to their existing participants and entice more to join. The more participants join, the more data can be generated,

and the smarter the platform will be. Such data intelligence can act as an isolating mechanism suited to prevent new firms from penetrating the SEPs' existing platform utilization. Moreover, the big-data-driven network effect, intertwined with the indirect network effect (between suppliers and consumers), is a difficult-to-imitate resource. That is, a large network of consumers and suppliers generates the indirect network effect, which, in turn, attracts more consumers and suppliers to the SEP and enhances the interaction among them. By adapting to the platform participants' needs and enhancing the network's size, the self-reinforcing mechanism between the indirect and data-driven network effects acts as a path-dependent and learning-by-doing process that can equip the platform with an isolating mechanism suited to protect it from imitation and preserve its rent streams.

Furthermore, we extended the RBV literature by identifying three patterns of resource orchestration for value creation in the digital context of SEPs. Scholars have pointed out that, although the RBV has received tremendous conceptual attention (Barney and Arikan, 2001; Kraaijenbrink *et al*., 2010; Priem & Butler, 2001; Sirmon *et al*., 2007), limited empirical work has looked inside the 'black box' of how firms manage resources to create value (Helfat *et al.*, 2007; Ndofor *et al.*, 2011; Sirmon *et al.*, 2007; Sirmon *et al.*, 2011), especially in regard to the new kinds of organization of the digital era. Herein, building on the resource orchestration framework—an extended version of the RBV suitable for dynamic environments—we empirically identified three patterns of resource orchestration and described how they require a unique and much more integrative approach to understanding and managing the internal and external resources of a platform. Relatively few studies have begun to examine the RBV and its extensions (such as the knowledge-based-view and the dynamic capabilities framework) on new the forms of organizations of the digital landscape—e.g., see Sun and Tse (2009) for applying the RBV, and Teece (2017) and Helfat and Raubitschek (2018) for applying the dynamic capabilities framework to digital platforms. Our findings extend our understanding of

resource orchestration and of the RBV to the previously under-theorized SEP firms, particularly those operating in the dynamic environments of emerging markets.

We note that the existing discussion on value creation had concentrated mainly on building an understanding of the internal aspects of an organisation, separately from its environment (Di Stefano *et al.*, 2010). Such streams of thought have mostly not extended beyond a firm's boundaries to explain enduring firm heterogeneity. In particular, they have engaged in a limited exploration of the broader context within which value creation is embedded and of how this context might affect sustainable firm differences. Our analyses indicate that, in the context of SEPs, value creation should incorporate the broader resource network in which a platform is embedded. From this integrated perspective, SEP value creation is achieved mainly through symbolic and purposeful interactions with external resources. Such collaboration is thus partly endogenous, as it is co-established by platforms and their surrounding external networks. Therefore, these sources of firm heterogeneity stem from a firm's embeddedness in its social and economic relationships with a broader ecosystem (cf. Adner, 2017). Such integrative capabilities (Helfat & Raubitschek, 2018) or the synergy between internal and external resources can augment a firm's internal capabilities (Capron & Mitchell, 2009; Chesbrough, 2003a,2003b). This is consistent with the previous research that highlighted the importance of building an ecosystem in a volatile business environment (Iansiti & Levien, 2004; Mars *et al*., 2012).

Managerial implications

Given the increased popularity of the sharing economy phenomenon and the prevalence of SEPs, investigations of how these firms create value can enlighten those existing SEP managers or individual entrepreneurs who may be inclined to venture into the sharing economy. Our study emphasized the critical role played by crowds of suppliers and consumers as the main

drivers of SEP success. It proposed two patterns of continuous engagement with external suppliers and consumers supplemented by the absorption of data analytic skills as the prime strategies suited to gain a sustainable competitive advantage. Firms can draw valuable resources through networks; thus, managers need to connect with a diverse range of actors within a given network in order to create more value for their customers. The findings of our study highlight the importance of harnessing the potential of big data for sharing economy platforms in order to create value for customers and develop a competitive advantage. Furthermore, the three patterns ascribed in this paper can therefore guide SEP managers in their efforts to thrive and survive in the hypercompetitive sharing economy context.

Given that the formal institutions of emerging markets are evolving, firms need to rely on external networks to generate value; thus, managers of SEPs operating in emerging markets need to carefully evaluate the internal resources of their firms and align them with the external resources of their network partners for value creation. As noted before, SEP participants can support the platform by providing supplementary solutions to deal with local regulations (Karanović *et al*., 2020). This support is highly important; particularly in emerging markets, in which the institutions are more uncertain and volatile. Moreover, constant and close interactions with suppliers and consumers can establish trust among the platform participants. On the one hand, perceived trust is highly dependent on the cultural factors found in the environment in which a SEP operates (Gu *et al*., 2020). On the other hand, ensuring trust is critical in markets with less formalized institutions, highlighting the on-demand adaptation of SEPs with the external environment in such markets even further.

Limitations and future research opportunities

Like any study, this paper has limitations that offer valuable opportunities for future research. Despite providing us with nuanced insights into our cases' business models and operation, our

multiple-case analyses have a limited generalizability power to other SEP contexts. Also, our selected cases are relatively young and entrepreneurial platforms. Yet, in addition to the multitude of small and emerging SEPs, we are witnessing quite a few large and established ones in various sharing economy sectors (e.g., Uber, Airbnb, and eBay). Our propositions, built on the cases we analysed, may not fit the latter; for example, one could argue that the technological infrastructure and data analytics capabilities used to connect the nearest driver to passengers, surge pricing, and tracing technologies—all of which are the internal resources of the firm—play an essential role in Uber's competitive advantage against new entrants. Future research may address and verify our results using larger samples drawn from different sharing economy sectors and SEPs with different sizes, market positions, and life cycles.

We contrasted our SEP cases with conventional high-tech firms to highlight the differences in value creation dynamics that emerge when the drivers of value creation are dramatically shifted to outside firm boundaries. Although we emphasized that the three resource orchestration processes we identified—on-demand resource adaptation, big-data-driven network effect, and ecosystem resource coordination—are particularly vital in the SEP setting, we acknowledge that, to some extent, they may overlap with other types of platforms. For instance, the significance of big data is not limited to SEPs; yet, we claim it is their essential internal resource, given that they hardly possess any others as sources of competitive advantage. Future studies may go beyond our dichotomous case selection (i.e., SEPs versus conventional firms) and shed light on the differential degrees of importance of each process in various platforms (Bai & Velamuri, 2020). For example, scholars could examine the extent to which ecosystem coordination differs between SEPs and technology-based innovation platforms such as videogame consoles or smartphone app stores. For instance, we emphasized the transactional aspect of big data, which breeds the data-driven network effect. However, the absorptive capacity to learn from big data through analytics is another essential success factor for firms

(Grover *et al.*, 2018; Gupta & George, 2016). Future studies could shed more light on both these aspects of big data as sources of competitive advantage for SEPs. Moreover, we based our theorizing on the resource orchestration framework, which we believe to be a fruitful perspective suited to study sources of value creation and competitive advantage in the hypercompetitive and rapidly evolving digital context. Relatedly, the dynamic capabilities perspective (Teece, 2009) is yet another promising framework for the study of digital markets (e.g., Helfat & Raubitschek, 2018; Teece, 2017), which calls for further studies to draw insights from this perspective and examine how sharing economy firms utilize various capabilities for value creation.

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Table 1 Background Characteristics and Data Sources for Cases

Company name	Socle	Du	Roan	Tog	Coe	Atima	
Year of establishment	2003	.2013	2014	2003	2014	2014	
Direct value creation provider	Buyers and sellers	Taxi drivers and taxi users	Local restaurant and homemade food providers, and consumers	Workflow and business process software provider	Data security software provider	Enterprise resource allocation software provider	
Semi-structured interviews	Six	Eight	Eight	Four	Five	Six	
Archival sources • Triangulated informant recollections • Help track external responses and coverage to organizational actions	Press articles Industrial statistics and reports Internal correspondence and memos Minutes of meetings Company newsletters	Press articles Industrial statistics and reports Internal correspondence and memos Minutes of meetings Company newsletters	Distributions of interviewees	Chief Operation officer Two Product managers Two Senior data analytics managers Customer service manager	Two senior executives Three product managers Two senior data product development managers Regional manager	Founder Senior operational executive Senior product manager Two Product managers Two senior data analysts Customer service manager	Co-founder Chief technolo officer Two senior en

Table 2 Stage in theory development

Analytical goal for stage	Raw data used	Analytical procedure and its outcome	Implication for new theory development
Describing the patterns of resource orchestration in the sample firms.	Interviews, company newsletters and reports, and featured articles.	Thematic analysis. Producing a table of differences between SEPs and conventional software firms	Shifted emphasis from internal to external resources.
Specifying the resource orchestration actions associated with the management of internal and external resources.	Case histories, interviews, and company newsletters and reports.	Breaking down the broad resource orchestration categories and reconceptualize the data; sequential coding of types of resource orchestration actions between different types of firms	Patterns of resource orchestration seem to depend on the value creation of the firm.
Uncovering key mechanisms that explain different patterns of resource orchestration between two types of firms	Interviews, internal correspondences and memos, and meeting minutes.	Coding the patterns that drive the resource orchestration of a firm.	Resource orchestration is no longer purely focussed on harnessing the internal resources of the firm, but on looking beyond the property of the firm and working with external resources to guide internal resource orchestration in an agile and experimental manner.
Developing an overall theoretical framework.	Interviews, case histories and data linked to new constructs.	Revision of the earlier framework, connect new construct to overall context to produce theoretical framework.	The boundary of resource orchestration gradually evolves from the management of internal static resources to that of internal and external dynamic and evolving resources to drive ecosystem coordination in a real time, agile and experimental manner.

Table 3 Key themes and illustrated quotes

Company name			Key themes	Illustrated quotes
Socle	Du	Roan	On –demand resource adaptation	"The best technology-supported platform does not mean that you automatically have the ability to get people to use your platform. It requires a different mindset, not thinking about what you have, we should think about bridging the relationship between creators and users that cannot be easily controlled by our platform. This requires constant interaction and feedback, not to improve our efficiency, but to help them to improve theirs, help them to make money. With this feedback, we had a much clearer idea about how to manage internally to support external coordination" (Roan, 03). "It is no longer about having a product and wanting to make it relevant to you [customers], wanting to make a sale. There are two layers here; yes, I have a platform, but I am not the provider of the goods you are consuming. How to get people using our platform is one thing, how to motivate people to provide goods to keep the other end, our customers, happy is something else. We need to use an outside-in approach to understand their [the customers'] pain, their losses, their inconveniences, and then use their point of view as a guiding logic to make changes fast to help them to solve the problem." (Du, 05). "It's about finding the bread crumbs. Every time we talk to them, understand and trace their behaviour online through a/b testing, it's about finding clues to help us to quickly push products/services out to help them interact. It is a constant feedback loop where you gather feedback, make changes, observe the reaction, then gather feedback again, make more changes." (Socle, 02). "Our relationship is like that between fish and water. Fish cannot survive without water. It is about building connections between them [the customers from the two-sides of the market], to understand their backgrounds, motivations and how they can benefit from joining the network, to understand their user experiences, both offline and online, and our actions are centred on their behaviours, their interactions. These details guide us to design better user experiences for them." (Du, 02).
A, A	A, A	A, a		
Socle	Du	Roan	Big data resource-driven network effect	"One of the valuable things you have is algorithms. But, in our world, everybody is pretty open about it and even top companies such as Google and Facebook made their algorithms open. It is not the algorithms themselves, algorithms are only valuable when you have a huge amount of data, which are the most valuable resources we have and are the key to help us to help our customers, to improve the whole customer experience" (Du, 04). "Data represent our customers, their behaviours, their preferences, and their thoughts; sometimes, even their feelings. When data are contextualized, they will generate many opportunities for you to identify new areas of market opportunities, they will attract people [third party developers] to drive and develop new ideas and products, they will improve the customer experience. Then, when the scale is built up, you will get more data" (Socle, 02) "When you make an effort to understand your customers through a/b testing or through other interactions, it will generate some kind of data, I view data as a form of currency that helps you understand who they [the customers] are, what they need. Sometimes even before they know they need it. Some people collect data but don't act on them; then, it is a waste of time. Data, particularly real time data, have huge value, and this is the key and the most valuable resource we have to drive our platform coordination among thousands and millions of customers. You will constantly learn, constantly change, then constantly gather more data. It is a positive learning loop. (Roan, 03).
A, a	A, A	A, A		

				"Data are like a lighthouse that guides us to move forward. Everything they [the customers] do digitally leave footprints that tell us what they like or prefer, their connections with others, the things on which they click. And every move they make also makes our AI smarter by constantly feeding the system more data to train it to be smarter. Our system can then provide better user experiences, more tailored experiences for them; sometimes, even before they know it themselves. With the scale and volumes of our customers, data are key to coordinating their activities. Both network coordination and data intelligences are what drives our platform" (Socle, 0Five).
Socle A, a	Du A, A	Roan A, A	Ecosystem resource coordination	**"**It is never about how many resources we can own. With our business, we own nothing but data and the infrastructure that enable us to collect them. We often say that it's about how many resources we can access, mobilise and aggregate; to us, the latter is so much more powerful than the ownership itself. Once we put all the mind-sets [of external partners] together, put our data together, we can actually come up with many many more opportunities, many more innovations, far beyond the ones we could imagine by ourselves."(Du, 04). "Having worked in this field for over ten years, I always say to people that the biggest problem we have is a lack of imagination. What we have is limited, even though we have the best technology, so what. I often talk to the people who work in the same field at Silicon Valley; yes, you have the best technology, but our way to commercialize the technology, to think about new business models is far better than that in the US. Why? They are very product-driven, technology-driven, we focus more on commercialization, but we can not do this by ourselves. It doesn't work like that; where you have one empire dominating the field. Large-scale commercialization requires large-scale collaboration, you need to show how other people can benefit from it, not just you. Once everybody can get a good slice of the pie, they are willing to coordinate with each other and with us to drive much larger market change. This collaboration will enable people to look at technology, look at the data from different perspectives, have different ideas." (Socle, 01) "The platform itself actually says it all, we are just a platform suited to set a stage for other people to perform, to sing, to make money. We never have the ownership of these people, of these resources. Our job is to attract people to come to our platform, but the number one reason they are here is because they think or know that we can help them to make money. The interaction and collaboration within a large network is the key to drive innovation. Diversity breeds innovation. We need to think about ways to attract a large and diverse audience to engage with us so they can benefit from such collaboration. We worked with a logistics company, local traffic control office, different businesses, and university professors to come up with different ways to benefit each other, to reimage the process and data from a different perspective." (Roan, 06).

Notes: codes for the evidence categories are as follows: "A", evidence from three or more interviews with different informants from the same company; "a", evidence from fewer than three interviews with different informants from the same company; "B", evidence from three or more archival sources; "b", evidence from fewer than three archival sources.

Figure 1 Emerged model of resource orchestration for SEPs.