Idle Asset Hunters—The Secret of Multi-sided Platforms

Daniel Trabucchi, Silvia Sanasi, Antonio Ghezzi, and Tommaso Buganza

Overview: Since the dot-com revolution in the early 2000s, traditional, vertically integrated firms have attempted to innovate using multi-sided digital platforms, matching customer and supplier groups to resolve the needs of both. These firms' underlying logic has disrupted traditional business models, enabling them to introduce new and counterintuitive value creation, delivery, and capture configurations. Using Uber and Airbnb, two prominent cases of multi-sided platforms, we present an overview of the dynamics governing value mechanisms within a platform through the theoretical lens of the business model. Multi-sided business models undergo three evolutionary phases: they solve the market friction; they exploit the critical mass they develop; and they unveil and capture new value derived from cocreation based on data. Our study reveals how successful platform providers act as *idle asset hunters* that can identify and leverage untapped assets. We propose a cycle that helps companies move from a two-sided to a multi-sided platform.

Keywords: Two-sided platforms, Multi-sided platforms, Business model, Digital platforms, Network externalities

This is the post-print version of the paper published on *Research-Technology Management* please cite as
Trabucchi, D , Sanasi, S , Ghezzi, A & Buganza, T (2021) Idle Asset Hunters—The Secret of Multi-sided Platforms, Research-Technology Management, 64:1, 33-42
To link to this article: https://doi.org/10.1080/08956308.2021.1842677

Dozens of digital platforms surround our daily lives. We move with Uber, gather information through Google, share our everyday lives on Instagram, Facebook, and Snapchat, make travel arrangements using Booking.com and Skyscanner, and order food through Deliveroo, UberEats, all while enjoying a new song on Spotify. All these companies share a common key characteristic: they are based on two-sided or multi-sided platforms.

The concept of two-sided platforms, later expanded in the more comprehensive "multi-sided platforms" label (Hagiu and Wright 2015), has its roots in the economic literature (Rochet and Tirole 2003) and refers to businesses characterized by having two or more groups of customers, linked through cross-side network externalities, which means that the value for one set of customers depends on the number of customers on the other side (Katz and Shapiro 1985) and an intermediary platform managing the system (Evans 2003). The credit card industry represents perhaps the most diffused example of two-sided platforms, where companies like Visa or Mastercard perform a payment function for both buyers and sellers and create a virtuous, self-reinforcing system.

By providing the infrastructure and tools to scale rapidly, the digital revolution enabled these kinds of businesses to flourish. As they grew in number and size, platform businesses proved to have a significant impact on the markets they entered, often leading to disruptive effects on incumbents (Trabucchi and Buganza 2020; Trabucchi and Magistretti 2020). The growing market and financial relevance of these kinds of platform businesses (Cusumano et al. 2019) have drawn researchers' attention, resulting in numerous studies that highlight their idiosyncrasies in comparison to traditional businesses. In contrast to traditional businesses (Amit and Han 2017), multi-sided platforms have peculiar resource configurations as customers take an active role in the value creation process. The platform providers consider both sides customers—just as both buyers and sellers receive a service from Visa or Mastercard—while they may (or may not) enable direct customer-supplier relationships. Therefore, two different roles exist within the platform: a demand side and a supply side (Täuscher and Laudien 2018), for which the platform provides a matchmaking role (Evans and Schmalansee 2016).

Two main kinds of multi-sided planforms exist. In transactional platforms (such as credit cards) customers and suppliers have a direct relationship and the platform enables the transaction. In nontransactional platforms (such as searchers and advertisers on Google), the two groups of customers do not execute a direct transaction with one another (Filistrucchi et al. 2014).

The intrinsic characteristics of two-sided platforms lead to specific challenges and opportunities that inherently define this kind of business. To create a multi-sided platform, for example, the platform provider needs to overcome the chicken and egg paradox—that is, convincing both sides of the potential value of the platform, which in reality is worthless until both sides are on board (Caillaud and Julien 2003). Why would merchants pay a fee for a credit card platform if no customers had that credit card yet?

The design process of the value proposition for multi-sided platforms is even more challenging than it is for traditional linear value chain businesses—or "pipelines"—as the

value proposition needs to be appealing for (at least) two interrelated groups of customers, creating de facto a double value proposition (Muzellec et al. 2015). Merchants receive a different product and service offering compared to credit card holders, reflecting the two customer groups' very different needs.

On top of those challenges, various opportunities characterize multi-sided platforms. The digital nature of most of these businesses enables them to gather and exploit a significant amount and variety of data coming from the different sides. These data may allow for the introduction of new sides into the equation to exploit the value embedded in the data (Trabucchi et al. 2017), through nontransactional mechanisms, such as advertisers in Facebook's model.

Furthermore, digital platforms can carry out all their operations at a relatively low cost compared with traditional incumbents with physical assets. The investments required to set up operate a hotel chain, for example, are much larger than those required to design, implement, and operate a digital platform like Airbnb. Furthermore, the flexible nature of these businesses tends to facilitate their further expansion, as the platform owners add new partners and new value propositions over time that innovate within the initial two-sided structure to create a more comprehensive multi-sided business (Trabucchi and Buganza 2020).

Many companies with global relevance successfully manage the trade-off between the challenges and opportunities (Cusumano et al. 2019). This study aims to explore the peculiarities of multi-sided platforms, how they create, deliver, and capture value, and how value flows throughout this complex ecosystem of relationships. We present a comprehensive framework to analyze these companies through the lens of their business models.

Literature Review

During the last decade, the business model has emerged as a unit of analysis in strategy, entrepreneurship, and innovation research (Euchner and Ganguly 2014; Spieth et al. 2014; Zott and Amit 2013), proving itself as a practical tool for both scholars and practitioners in analyzing the "logic" of a firm and the operationalization of its strategy (Casadesus-Masanell and Ricart 2010; Cortimiglia et al. 2016). In other words, a company's business model describes the set of mechanisms that enable it to generate added value for one (or more) groups of customers, make its offerings available to them, and then capture a portion of the value in terms of profits (Teece 2010).

Value is the core concept around which the business model construct revolves. The business model's role is mapping the allocation of value to each element of a firm's strategy and also the way it flows across different stakeholders along the value chain (Porter and Millar 1985). The process of value creation, the consequent appropriation of such value, and its conversion into profits—the process of value capturing—are the firm's focal activities (Ballon 2007).

While creating and capturing value, firms engage in relationships with actors such as suppliers and customers in the attempt to create a value network they can rely upon and which can serve as an extension of their resources (Amit and Han 2017). A firm offers its customers a specific value proposition, embodied in a product or service that the customer prefers over alternatives (McDonald and Eisenhardt 2019). The firm conveys this value proposition to the customer through value delivery and value communication activities, where the former constitute how value is brought to the customers and the latter involves all the activities the firm engages in to communicate its offering to customers (Rayna and Striukova 2016).

Business Models and Digital Platforms

Several scholars have argued how innovative business models often go hand-in-hand with technological innovation (Baden-Fuller and Haefinger 2013). In fact, new ventures are reshaping traditional value architectures by leveraging digital technologies to create novel resource configurations (Sussan and Acs 2017). Platforms can now reach multiple groups of users at lower costs than were previously possible (Acs et al. 2002). Just by opening their smartphone's browser, users can access the services offered by platforms such as Facebook or Google, and this access does not require the construction of any dedicated distribution or communication channel. The reach enabled by such new value architectures is a major reason that the rise of multi-sided platforms challenge traditional business models: multi-sided platforms act as intermediaries between different kinds of "customers," matching supply and demand of a given resource, and engaging in new forms of interaction with different customer groups (Amit and Han 2017).

The new platform-based business models have led to a shift from the traditional resource-based view of the firm (Barney 1991). We are witnessing a transition from traditional firms, which leverage their internal resources to rework raw materials (Porter and Millar 1985), to platform companies, which act as intermediaries that match suppliers of ready-to-use products or services with end users (Priem et al. 2018). While in traditional firms value flows along the value chain from upstream to downstream (Porter and Millar, 1985), in platform-based business models value stems from the interaction that takes place in the digital marketplace between users and agents (Ramaswamy and Ozcan 2018), enabled and enhanced by the positive network effects occurring between the sides (Katz and Shapiro 1985). This value-creating process is, in a real sense, the result of cocreation between all stakeholders involved (Sussan and Acs 2017). These business models have laid the groundwork for novel ways of delivering value to end users and making them part of the value creation process as value cocreators (Amit and Han 2017). Examples include the phenomenon of asset sharing—the sharing economy—where different groups of users share with each other underused assets, so that customers themselves assume both the role of supply and demand (Sanasi et al. 2020).

Scholars have studied value-capturing mechanisms for two-sided platforms to understand how they monetize from, or alternatively subsidize, one or more sides of the market (Rochet and Tirole 2003). Now they study ways to create additional value by exploiting the data collected through the transactions (Trabucchi et al. 2017). Recent literature on business models considers multi-sided platforms an idiosyncratic value architecture

(Amit and Han 2017). Researchers have highlighted the peculiarities of these models in terms of novel means of value creation (Ramaswamy and Ozcan 2018) and value capture (Rochet and Tirole 2003). What's missing is a comprehensive understanding of value mechanisms in such complex systems. This study aims to fill the gap by exploring multi-sided business models from a value perspective to understand the relationships among the parties involved.

The Study

We chose a qualitative case study based on Uber and Airbnb, two of the most representative multi-sided platform companies. We selected these two paradigmatic, illustrative cases (Siggelkow 2007) for two main reasons: they represent the most famous examples of multi-sided platforms that made this business model so popular; and they are two successful examples that have thrived, grown, and evolved over time. Uber operates in the mobility industry, acting mainly as a matchmaker between passengers and drivers. Airbnb operates in the accommodation industry, connecting people looking for and people offering a place to stay. Both companies went through fast, significant—and at times controversial—growth that made them two of the most valuable unicorns, as well as two of the most discussed companies because of their impact on traditional businesses. They represent the flagship of platform business models.

Given their worldwide popularity and the extensive availability of data about them, we used secondary sources to analyze the two cases. Our ability to map the evolution of Uber and Airbnb through official statements (press releases, books, website, official blogs), newspapers, and magazines, allowed for data triangulation and for an evolutionary understanding. Our approach is consistent with previous research with similar goals on digital business models (Ogilvie 2015; Rayna and Striukova 2016).

Two Inspiring Cases: Uber and Airbnb

Uber and Airbnb are two of the most prominent representatives of platform business models (Sussan and Acs 2017; Täuscher and Laudien 2018), as they depict the configuration where a focal firm acts as an intermediary between different customer sides that create value for one another (Amit and Han 2017). Although they operate in different industries, the initial idea upon which both platforms were developed is similar: to act as intermediaries between supply and demand, enabling users willing to monetize on unsaturated resources (car, apartment, time) in favor of users looking for alternative solutions to the traditional marketplace in their transportation or accommodation choices. Neither platform directly owns any of the assets related to its core business: the companies' value-creating activity is matching users with a need with users who can meet that need, cocreating value together while capturing it back as a transaction fee. Throughout time, both platforms have changed the way value is created, delivered, and captured within the system, leading to significantly different value mechanisms across time and across all stakeholders involved. Such changes have sometimes involved other stakeholders that go beyond simple users of the platform's core business, increasing and supplementing the platform's value-creating intermediation activity.

Uber

Uber's founding idea in 2009 was to enable people to quickly and easily find a ride to get anywhere in the city, hailing the closest cab through a mobile app. The idea translated into a digital platform that let a fleet of mostly independent and self-employed drivers, equipped with high-end black cars, transport passengers in exchange for monetary compensation, where both driver and passenger would then reciprocally evaluate the quality of their ride. In this configuration, Uber created value by simply letting passengers, usually professionals, find a convenient and comfortable alternative to traditional taxi rides, which are difficult to find, expensive, and often low-quality. The system would also enable drivers to access trustworthy clientele, earning fees on rides without the need to purchase an expensive medallion, a license that taxi drivers must purchase to get a permission to perform their services (Lashinsky 2017).

Since its foundation, Uber's value mechanisms have changed profoundly, driven by the expansion to other business areas and regulatory issues. At first, Uber experimented within its existing value proposition, launching services like *UberX*, introducing the possibility for any car owner to offer rides using their own car. The shift allowed for cheaper rides, enlarging the customer base, while at the same time setting up a more diffused and reliable mobility service, raising the quest for higher service level and security control. In this configuration, growing the mass of both customer sides would increase both sides' incentive to use the platform.

Uber's entry into the delivery business in 2014 marked the most significant shift in the platform. Using the synergies within its existing logistics competencies, Uber introduced fleets of riders into major hubs, addressing new customer segments—that is, businesses that needed to deliver products, of which restaurants were the most important. In 2015, Uber launched *UberEats*, a dedicated app where end users could order food from their favorite restaurants. Uber grew its customer base by addressing a completely new kind of business customer, extending its supplier base, and capturing new ride-sharing customers and retaining existing ones.

In 2019, Uber introduced *Uber Movement*. Given the large body of data collected on traffic, Uber puts traffic data at the community's disposal to facilitate others solving global and local transportation challenges. This operation opened Uber's business model to a wider and new customer group—namely, anybody interested in analyzing traffic data. The platform has used its immense pool of user-generated information and put it at its community's disposal to give back some of the value it captured and create new value for third parties in a remarkably innovative way. Data users contribute to value-creating activities by cocreating Uber's future and provide Uber with new, unexploited value-capturing potential.

Airbnb

Airbnb's initial purpose was to connect travelers on a budget with people who were willing to earn extra income by renting out rooms in their apartment, creating value for both sides while driving revenues out of expensive hotels and into renters' pockets. Since its inception, the platform has gained momentum, building onto its initial travel-on-

a-budget idea, to develop the concept of traveling to create a sense of "belonging" to the local community (Gallagher 2017).

In late 2014, Airbnb introduced "Experiences," adding the possibility for travelers to book activities—such as cooking classes, city tours, or even workouts—in a given city. The platform started acting as an enabler for creating connections between travelers and locals. This addition brought a new way of creating value: it introduced a new customer segment—activity providers—but also added a value-creating activity for all sides involved. It facilitated the emergence of positive externalities by enlarging the platform's offering for existing users, letting them become part of the overall travel experience rather than just servicing it. This way, Airbnb enticed a wider public of travelers, interested in experiencing local authenticity rather than just finding cheap accommodation options, who would select more expensive and premium solutions to better experience a sense of belonging. At the same time, it attracted a wider range of locals, giving them the chance to not only offer accommodation but also local knowledge and time. All three value-creating mechanisms also enhanced Airbnb's capability to capture value back, driving higher margins on more luxurious accommodations and improving the attractiveness of the platform because of its growing user base, and in turn increasing the demand for accommodation and experiences.

In 2017, Airbnb also introduced *Airbnb Citizen*, an editorial magazine dedicated to the way Airbnb has shaped lives and communities, to promote Airbnb's initiatives and a selection of its best hosts' stories. *Airbnb Citizen* is set up as a direct communication channel between Airbnb and its current (or potential) users and leverages information coming from its community. This way, Airbnb has reinforced its link to both travelers and hosts, creating greater awareness and a sense of belonging within the Airbnb community and attracting curious users driven by interesting stories.

Multi-Sided Business Model Framework

Based on common patterns that emerged during Uber and Airbnb's evolution, we propose a three-step framework for mapping their value mechanisms and business model evolution over time.

Step 1: Solving Market Friction

Creating the platform is the first step. The platform provider aims to solve the market friction, acting as a matchmaker between parties that may encounter issues or costs when trying to connect to one another (Evans and Schmalansee 2016). We can observe the constituting elements of a typical two-sided platform, where a cental platform provider matches two transactional sides (Figure 1).

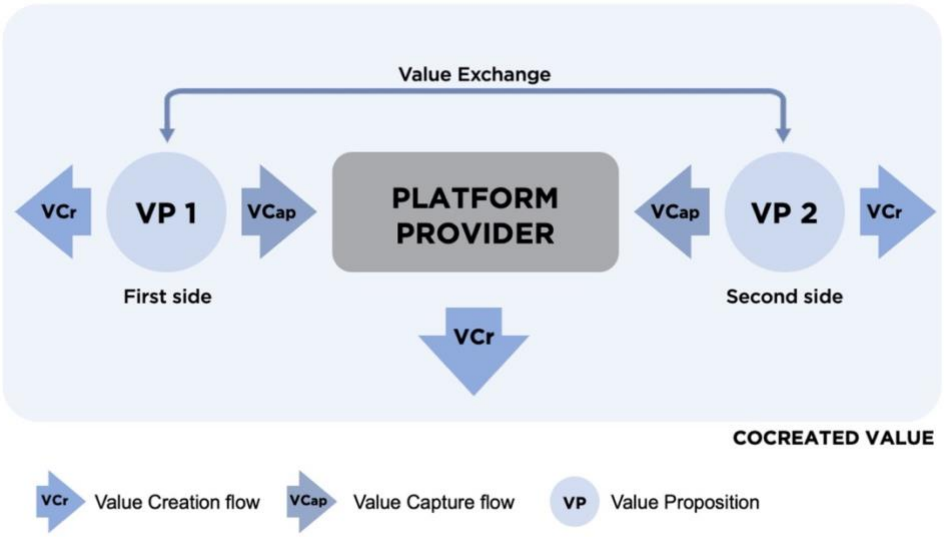

Figure 1.—Step 1: Solving the market friction

Compared to traditional business, some initial peculiarities exist in terms of the value mechanisms (Rayna and Striukova 2016). The platform provider has a role in the value creation process, setting up the entire system; however, there are other sources of value outside the organization (Amit and Han 2017). The two sides joining the platform create value for the entire system, generating and enhancing cross-side network externalities (Katz and Shapiro 1985). Having two groups of customers, the platform provider can capture value from both sides (such as in Airbnb), by charging a fee on one side while keeping a percentage of the transaction from the other. Value creation and value capturing are at the basis of any innovation that reaches the market (Teece 1986), and they represent the basic elements of the business model (Teece 2010). Nevertheless, these cases enable the two sides to exchange value between one another. Such value exchange is a peculiarity of a multi-sided business model, where different players may be the platform provider's customers while also acting as customers and suppliers between each other.

Finally, both platforms have crafted a value proposition for each side—VP1 and VP2—that represent a double value proposition (Muzellec et al. 2015).

Step 2: Exploiting Critical Mass

A supply-side extension represents the second step of the evolution of a multi-sided business model (Trabucchi and Buganza 2020) (Figure 2). A second transactional line generated by a new supply side joins the first one that has the original two sides (such as accommodation for Airbnb and ride-hailing for Uber). This third side, represented by experience providers in Airbnb and by restaurants in Uber, offers new implications in terms of value mechanisms. First, the new "third" side leads the transition from a double value proposition (Muzellec et al. 2015) to a multi-sided value proposition, composed of

the joint effort of VP1, VP2, and VP3. The new side generates a new value creation flow for the entire system and a new potential value capturing flow towards the platform. Similarly, the new side also generates a new value exchange flow towards the demand side. Finally, an additional value-creating flow may establish itself between the second and the third side: the presence of two different supply sides increases the value of the overall ecosystem, thanks to new value-creating possibilities introduced for the second and third sides, generating a *value expansion* mechanism.

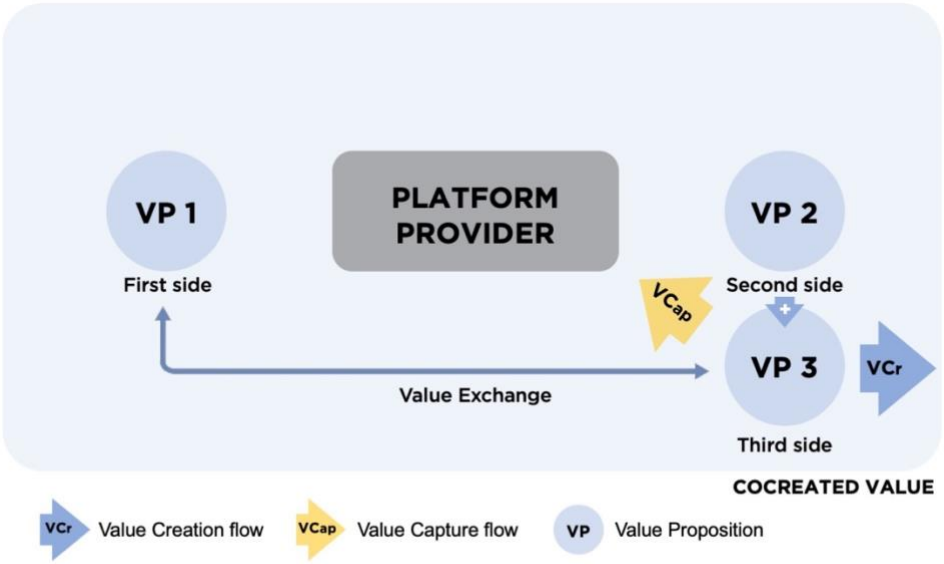

Figure 2.—Step 2: Exploiting the critical mass

Hosts originally on the platform may experience a service expansion (Sawhney et al. 2003; Magistretti, Dell'Era, and Verganti, 2020), embracing the third, newly introduced value proposition and becoming experience providers. Similarly, drivers can enhance their business by transporting not only people but also food, thanks to the presence of restaurants on the third side. The two cases are similar, although not exactly the same: Airbnb hosts can join the third side, while for Uber, the drivers act as an enabler to engage the third side (restaurants). In both cases, the platform exploits further the critical mass generated before by welcoming new players.

Step 3: Capturing Unaware Cocreated Value

Adding nontransactional players to the platform is the third step in the evolution of multi-sided business models (Figure 3). Previous literature showed various strategies to add new players without adding transaction lines (Trabucchi and Buganza 2020). Usually, such additions are a way to increase revenue flows, exploiting idle capacity embedded in the platform's assets. From the perspective of value mechanisms, this additional step reveals something deeper. Considering Airbnb Citizen and Uber Movement, we can see

how the platform provider finds a way to exploit the value embedded in its current assets by adding a new side that has its own value proposition (VP4). Adding a new value capturing flow consequently increases the potential revenue flows towards the platform and changes the value creation dynamics. The two (or more) sides that contribute to the data generation are not the ones to exploit them and often do not have a clear perception of the value they are helping to create.

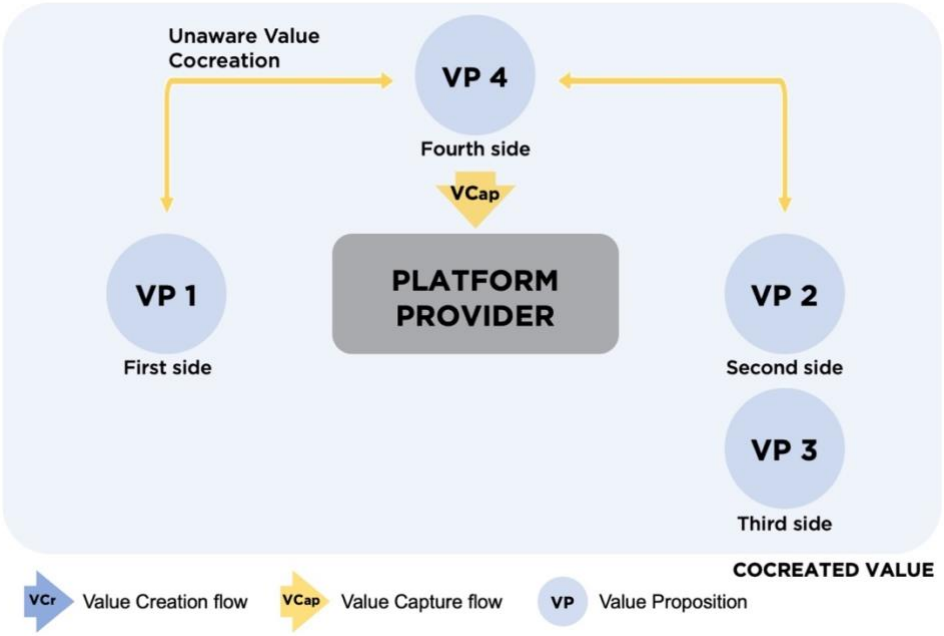

Figure 3.—Step 3: Capturing unaware cocreated value

When working on a transactional line, each player is aware of the value it brings into the system (money, rides, food, experiences). Neverthless, there are cases in which each player is not completely aware of the value it brings into the system. As Airbnb and Uber illustrate, this third step of the evolution is based on data exploitation, which has been created as a by-product of the original business. The platform exploits such data thanks to the presence of a new set of players, the ones who'd like to leverage Uber's data through Uber Movement or the curious readers of Airbnb Citizen (Trabucchi et al. 2017). The players create value unconsciously while using the platform, driving the emergence of a different kind of value mechanism that seems to be a peculiarity of a multi-sided business model: an *unaware value cocreation* flow.

Peculiarities of Multi-sided Business Models

Previous work in the field of business models has mapped different types of value on classic businesses (Rayna and Striukova 2016). Multi-sided platforms, matching two or more groups of customers, are more complex in terms of value mechanisms. Our work—mapping existing value mechanisms across the different players involved and considering the evolution of the system over time—aims to highlight the peculiarities of multi-sided business models in terms of value mechanisms.

A first peculiarity stems from the traditional value creation and value capturing flows (Figure 4). The multiple nature of these business models requires the multiplication of flows: all participants, including the platform provider and the sides, participate in the value creation process, embodying a collective value creation process. By joining the platform each of the players attributes value to something that is intrinsically worthless without customers (Rochet and Tirole 2003), thanks to their interaction with the other sides (Ramaswamy and Ozcan 2018) in the process of value expansion (Wieland et al. 2016). At the same time, multiple value creation flows allow the platform provider to benefit from multiple value capturing flows (Rysman 2009).

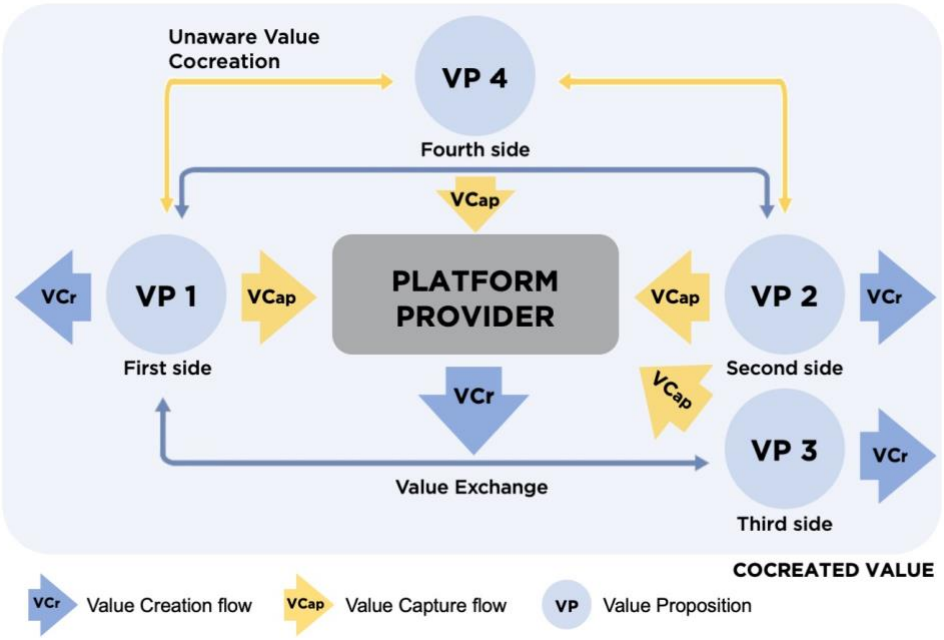

Figure 4.—Step 4: Multi-sided business model

Three key peculiarities differentiate multi-sided business models from traditional business models: the concept of value exchange, the unaware value cocreation process, and the creation of a multi-sided value proposition as the sum of the single sides' value propositions.

Value Exchange—In traditional businesses the value creation process is led mainly by the firm, or eventually demanded to the crowd (Ghezzi et al. 2018), whereas multi-sided business models offer a more complex model. Having at least two interconnected groups of customers, a demand side and a supply side, exchanging value with one another, we need to add a different type of value mechanism—value exchange—that combines the concepts of creation and capture between two entities.

Unaware Value Cocreation—In digital services, a great amount and variety of data are created, while customers enjoy (or in this case, even deliver) the service (Trabucchi et al.

2017). Companies may be able to leverage specific strategies to capture such value by involving nontransactional sides in the system (Trabucchi et al. 2017). We explored the underlying value mechanisms behind these strategies. The vast body of data generated provides an additional source of value, resulting in a new value capturing flow for the platform provider. Such body of data is the result of the unintended contribution of all the customer sides involved, making them unaware value cocreators. When joining the platform the sides perceive they will create value for and exchange value with the other transactional sides, however, often they do not realize their additional role when cocreating value for other customer groups that join the system without participating in the core service delivery. Even though they create this value in an "unaware" way, companies must approach this value ethically. Multi-sided business models should be transparent with customers about the source of data and their possible uses. For example, Uber Movement transparently declares it's based on data gathered by Uber over the years, then used as an aggregate to improve mobility.

Multi-sided Value Proposition—When different customer groups are interrelated, companies must define at least a double value proposition that brings the two initial sides to join the platform (Muzellec et al. 2015). These two value propositions are just the first two building blocks of a more complex multi-sided value proposition that needs to be considered when dealing with multi-sided business models. Each side needs a specific value proposition that in turn needs to be part of a greater direction and represent the entire system.

These three peculiarities help to understand the complex ecosystem of relationships created around a multi-sided business model.

Exploiting Multi-sided Business Models

The business model has become one of the most relevant *loci* of innovation. Until now, business models have focused mainly on traditional and linear value chain models. Now, multi-sided platforms are popular and subject to investigation. Although researchers studying multi-sided platforms have shed light on their dynamics and peculiarities, there's no comprehensive understanding of how multi-sided-platform business models work.

Our framework shows how the different value mechanisms within a platform's multi-sided business model behave in such complex systems. We highlight peculiarities that require the introduction of new concepts. We provide managers with concrete suggestions to exploit multi-sided business models. Many companies in different industries and countries claim to be "the new Uber" or "the new Airbnb" for a different kind of service. Nevertheless, Uber and Airbnb remain the leading examples of a multi-sided platform. Our study shows how multi-sided platforms evolve and innovate, relying repetitively on three sequential steps:

1. *Identify Idle Assets:* The platform provider identifies a market friction and sets up a two-sided platform to reduce it, leveraging idle resources that are offered on the market to a counterpart that is in need of that specific resource.

2. *Design Value Proposition(s):* The platform provider needs to identify and design the proper value propositions to bring the sides on board.

3. *Get Players on Board:* The platform provider needs to convince the sides to join the platform, to let externalities flourish (Figure 5).

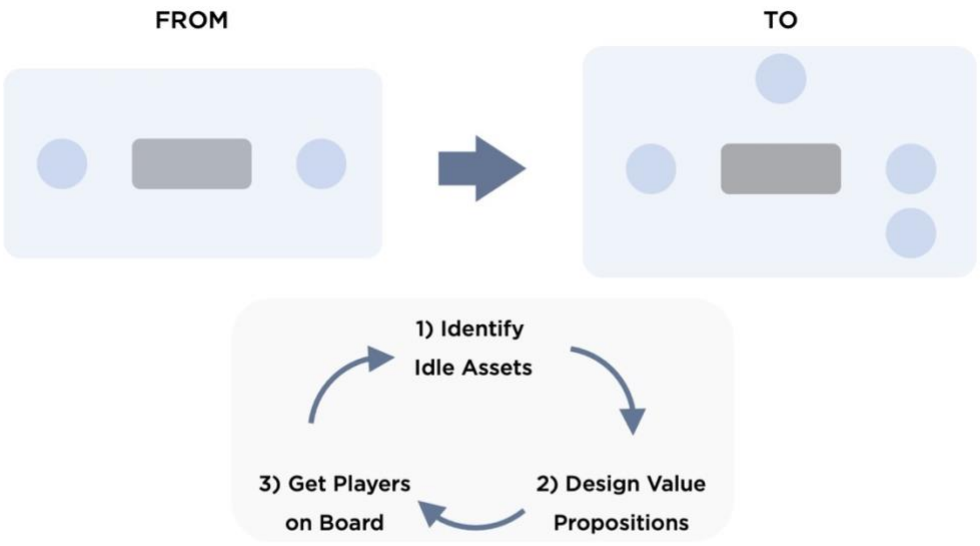

Figure 5.—Step 5: From two-sided to multi-sided business model

Although these three phases are nothing new to set up a two-sided platform, we see them as a continuous cycle. Once the first two sides are on board, new idle assets will be created and exploited. Idle assets may encompass the drivers' free time waiting for a call, the travelers' interest in the local culture, or data coming as a byproduct of the service delivery. These new idle assets re-open the cycle: as the value embedded in emerging idle assets is available to be leveraged, new sides may join.

Conclusion

Successful multi-sided platforms act as idle asset hunters: they know the moves, they know the game, and they are constantly eager to grow in neighboring areas. Our three-step framework reveals how multi-sided business models exchange value, cocreate value "unaware," and offer value propositions for all sides involved. Drawing on the examples of Uber and Airbnb, we offer insights and suggestions for ways firms can tap into and exploit the value mechanisms of multi-sided business models. The question is: what's their next side?

References

Acs, Z. J., de Groot, H., and Nijkamp, P. eds. 2002. The emergence of the knowledge economy: a regional perspective. New York: Springer.

Amit, R., and Han, X., 2017. Value creation through novel resource configurations in a digitally enabled world. *Strategic Entrepreneurship Journal* 11(3): 228–242. DOI: 10.1002/sej.1256

Baden-Fuller, C., and Haefliger, S. 2013. Business models and technological innovation. *Long Range Planning* 46(6): 419–426. DOI: 10.016/j.lrp.2013.08.023

Ballon, P. 2007. Business modelling revisited: the configuration of control and value. *INFO-The Journal of Policy, Regulation and Strategy for Telecommunications* 9(5): 6–19. DOI: 10.2139/ssrn.1331554

Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17(1): 99–120. DOI: 10.1177/014920639101700108

Caillaud, B., and Jullien, B. 2003. Chicken & egg: Competition among intermediation service providers. *RAND Journal of Economics* 34(2): 309–328. DOI: 10.2307/1593720

Casadesus-Masanell, R., and Ricart, J. E. 2010. From strategy to business models and onto tactics. *Long Range Planning* 43(2-3): 195–215. DOI: 10.1016/j.lrp.2010.01.004

Cortimiglia, M.N., Ghezzi, A. and Frank, A.G., 2016. Business model innovation and strategy making nexus: evidence from a cross-industry mixed-methods study. *R&D Management* 46(3): 414–432. DOI: 10.1111/radm.12113

Cusumano, M. A., Yoffie, D. B., and Gawer, A. 2019. *The Business of Platforms: Strategy in the Age of Digital Competition, Innovation, and Power*. New York: HarperCollins Publishers.

Euchner, J. and Ganguly, A., 2014. Business model innovation in practice. *Research-Technology Management* 57(6): 33–39. DOI: 10.5437/08956308X5706013

Evans, D. S., and Schmalensee, R. 2016. *Matchmakers: The New Economics of Multisided Platforms. (Anonymous Trans.).* Boston: Harvard Business Review Press.

Evans, D. S. 2003. The antitrust economics of multi-sided platform markets. *Yale Journal on Regulation* 20(2): 325–381. DOI: 10.2139/ssrn.332022

Filistrucchi, L., Geradin, D., Van Damme, E. and Affeldt, P. 2014. Market definition in two-sided markets: Theory and practice. *Journal of Competition Law and Economics* 10(2): 293–339. DOI: 10.2139/ssrn.2240850

Gallagher, L. 2017. *The Airbnb story: how three ordinary guys disrupted an industry, made billions... and created plenty of controversy.* Boston: Houghton Mifflin Harcourt.

Ghezzi, A., Gabelloni, D., Martini, A., and Natalicchio, A. 2018. Crowdsourcing: a review and suggestions for future research. *International Journal of Management Reviews* 20(2): 343–363. DOI: 10.1111/ijmr.12135

Hagiu, A., and Wright, J., 2015. Multi-sided platforms. *International Journal of Industrial Organization* 43: 162–174. DOI: 10.2139/ssrn.2794582

Katz, M. L., and Shapiro, C. 1985. Network externalities, competition, and compatibility. *The American Economic Review* 75(3): 424–440. https://www.jstor.org/stable/1814809

Lashinsky, A. 2017. *Wild ride: Inside Uber's quest for world domination*. New York: Portfolio.

Magistretti, S., Dell'Era, C., & Verganti, R. (2020). Look for New Opportunities in Existing Technologies: Leveraging Temporal and Spatial Dimensions to Power Discovery. *Research-Technology Management*, 63(1), 39-48. DOI: 10.1080/08956308.2020.1686292

McDonald, R., and Eisenhardt, K., 2019. Parallel play: Startups, nascent markets, and the effective design of a business model. *Administrative Science Quarterly* 65(2): 483-523. DOI: 10.1177/0001839219852349

Muzellec, L., Ronteau, S., and Lambkin, M. 2015. Two-sided Internet platforms: A business model lifecycle perspective. *Industrial Marketing Management* 45(1): 139–150. DOI: 10.1016/j.indmarman.2015.02.012

Porter, M. E., and Millar, V.E. 1985. How information gives you competitive advantage. *Harvard Business Review*, July. https://hbr.org/1985/07/how-information-gives-you-competitive-advantage

Priem, R.L., Wenzel, M., and Koch, J. 2018. Demand-side strategy and business models: Putting value creation for consumers center stage. *Long Range Planning* 51(1): 22–31. DOI: 10.1016/j.lrp.2017.07.007

Ogilvie, T. 2015. How to thrive in the era of collaborative services entrepreneurship. *Research-Technology Management* 58(5): 24–34. DOI: 10.5437/08956308X5805369

Ramaswamy, V., and Ozcan, K. 2018. What is co-creation? An interactional creation framework and its implications for value creation. *Journal of Business Research* 84: 196–205. DOI: 10.1016/j.jbusres.2017.11.027

Rayna, T., and Striukova, L., 2016. From rapid prototyping to home fabrication: How 3D printing is changing business model innovation. *Technological Forecasting and Social Change* 102: 214–224. DOI: 10.1016/j.techfore.2015.07.023

Rochet, J. C., and Tirole, J., 2003. Platform competition in two-sided markets. *Journal of the European Economic Association* 1(4): 990–1029. DOI: 10.1162/154247603322493212

Rysman, M. 2009. The economics of two-sided markets. *The Journal of Economic Perspectives* 23(3): 125–143. DOI: 10.1162/154247603322493212

Sanasi, S., Ghezzi, A., Cavallo, A., and Rangone, A. 2020. Making sense of the sharing economy: a business model innovation perspective. *Technology Analysis & Strategic Management* 32(2): 1–15. DOI: 10.1080/09537325.2020.1719058

Sawhney, M., Balasubramanian, S., and Krishnan, V. V. 2003. Creating growth with services. *MIT Sloan Management Review* 45(2): 34–44. https://sloanreview.mit.edu/article/creating-growth-with-services/

Siggelkow, N. 2007. Persuasion with case studies. *Academy of Management Journal* 50(1): 20–24. DOI: 10.5465/amj.2007.24160882

Spieth, P., Schneckenberg, D. and Ricart, J.E., 2014. Business model innovation–state of the art and future challenges for the field. *R&D Management* 44(3): 237–247. DOI: 10.1111/radm.12071

Sussan, F., and Acs, Z. J. 2017. The digital entrepreneurial ecosystem. *Small Business Economics* 49(1): 55–73. DOI: 10.1007/s11187-017-9867-5

Täuscher, K., and Laudien, S. M. 2018. Understanding platform business models: A mixed methods study of marketplaces. *European Management Journal* 36(3): 319–329. DOI: 10.1016/j.emj.2017.06.005

Teece, D. J. 1986. Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy. *Research Policy* 15(6): 285–305. DOI: 10.1016/0048-7333(86)90027-2

Teece, D.J. 2010. Business models, business strategy and innovation. *Long range planning* 43(2-3): 172–194. DOI: 10.1016/j.lrp.2009.07.003

Trabucchi, D., and Buganza, T. 2020. Fostering digital platform innovation: From two to multi-sided platforms. *Creativity and Innovation Management* 29(2): 345-358. DOI: 10.1111/caim.12320

Trabucchi, D., Buganza, T., and Pellizzoni, E. 2017. Give away your digital services: leveraging big data to capture value. *Research-Technology Management* 60(2): 43–52. DOI: 10.1080/08956308.2017.1276390

Trabucchi, D., and Magistretti, S. (2020). The battle of superheroes: the rise of the knowledge platform strategy in the movie industry. *Journal of Knowledge Management* 24(8): 1881-1898. DOI: 10.1108/JKM-04-2020-0296.

Wieland, H., Koskela-Huotari, K., and Vargo, S. L. 2016. Extending actor participation in value creation: an institutional view. *Journal of Strategic Marketing* 24(3-4): 210–226. DOI: 10.1080/0965254X.2015.1095225

Zott, C., and Amit, R. 2013. The business model: A theoretically anchored robust construct for strategic analysis. *Strategic Organization* 11(4): 403–411. DOI: 10.1177/1476127013510466

Bios:

Daniel Trabucchi is an assistant professor at Politecnico di Milano's School of Management where he serves as a researcher of LEADIN'Lab, the Laboratory for Leadership, Design and Innovation. He researches innovation management with particular focus on how digital two-sided platforms can create and capture value and their related data-driven business models. He has published his research in peer-reviewed journals such as *Technological Forecasting and Social Change*, *Internet Research*, *Research-Technology Management*, *Creativity and Innovation Management*, *Technology Analysis and Strategic Management*, and *European Journal of Innovation Management*. He has a PhD in Management Engineering. daniel.trabucchi@polimi.it

Silvia Sanasi is a PhD candidate in strategic management, innovation, and entrepreneurship at Politecnico di Milano's School of Management, where she also collaborates as a researcher in the Hi-Tech Startups and Startup Intelligence Observatories. Her main research interest lies in the use of experimentation for business model design, innovation, validation, and scaling in both startups and established companies. She also researches the strategic management and business models of digital startups, with particular focus on multi-sided platforms. She has published articles in peer-reviewed journals such as *Technology Analysis and Strategic Management* and *Competitiveness Review*, as well as in conference proceedings. silvia.sanasi@polimi.it

Antonio Ghezzi is an associate professor of strategy and entrepreneurship in Politecnico di Milano's Department of Management, Economics, and Industrial Engineering. His main research field is strategy, entrepreneurship, and digital transformation, with a focus on startups' business model design, innovation, and validation. He has published more than 100 articles in journals such as *International Journal of Management Reviews*, *Technological Forecasting and Social Change*, *Journal of Business Research* and *R&D Management*. He has also written books, book chapters, and conference proceedings. He has a PhD in management engineering. antonio1.ghezzi@polimi.it

Tommaso Buganza is an associate professor of leadership and innovation at Politecnico di Milano's School of Management where he also is cofounder of LEADIN'Lab. He is a

member of the scientific committee of the International Product Development Management Conference EIASM-IPDMC. His research focuses on the intersection between technological innovation and leadership. He has published articles in *Journal of Product Innovation Management*, *International Journal of Innovation Management*, *European Journal of Innovation Management*, and *Creativity and Innovation Management*. He is also a reviewer for many of these journals. He has a PhD in management engineering. tommaso.buganza@polimi.it