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Management Review

Strategic Decisions for Multisided Platforms

By Andrei Hagiu

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Multisided platforms such as eBay and Facebook create value by enabling interactions between two or more customer groups. But building and managing a winning platform isn't easy.

BY ANDREI HAGIU

MULTISIDED PLATFORMS (MSPS) are technologies, products or services that create value primarily by enabling direct interactions between two or more customer or participant groups. Prominent examples of MSPs and the participants they connect include Alibaba.com, eBay, Taobao and Rakuten (buyers and sellers); Airbnb (dwelling owners and renters); the Uber app (professional drivers and passengers); Facebook (users, advertisers, third-party game or content developers and affiliated third-party sites); Apple's iOS (application developers and users); Google's Android operating system (handset manufacturers, application developers and users); Sony's PlayStation and Microsoft's Xbox gaming consoles (game developers and users); American Express, PayPal and Square (merchants and consumers); shopping malls (retail stores and consumers); Fandango (cinemas and consumers); and Ticketmaster (event venues and consumers).¹



THE LEADING QUESTION

What are some of the strategic issues that multisided platforms (MSPs) face?

FINDINGS

- ▶ Decisions need to be made about governance, platform design, pricing and number of sides.
- ▶ No side of the platform will join without the other or others.
- ▶ Most MSPs subsidize at least one side of their platform.

As these examples illustrate, MSPs include some of the largest and fastest-growing businesses of the past decade. Why? Successful MSPs create enormous value by reducing search costs or transaction costs (or both) for participants. As a result, MSPs often occupy privileged positions in their respective industries; most other industry participants revolve around and depend on MSPs in important ways. (See “How Multisided Platforms Differ from Product Platforms and Resellers.”)

This article offers an analysis of four fundamental strategic decisions and associated trade-offs that set MSPs apart from other types of businesses and that every MSP entrepreneur and investor should carefully consider. (See “About the Research.”) These challenges are the following:

- the number of sides to bring on board;
- design;
- pricing structures; and
- governance rules.

Basic Features of Multisided Platforms

An important feature of most MSPs is that the value to customers on one side of a platform typically increases with the number of participating customers on another side. This is known as the presence of “cross-side network effects,” sometimes referred to as “indirect network effects.”² For example, sellers derive more value from eBay when there are more buyers and vice versa.³ However, cross-side network

effects are a double-edged sword. On the one hand, they can create high barriers to entry, which explains why successful MSPs occupy privileged and often hard-to-assail positions in their respective industries. On the other hand, erecting that barrier is difficult because of an inherent chicken-and-egg problem: No side will join without the other or others. Overcoming the chicken-and-egg problem is one of the most difficult challenges for many MSPs.

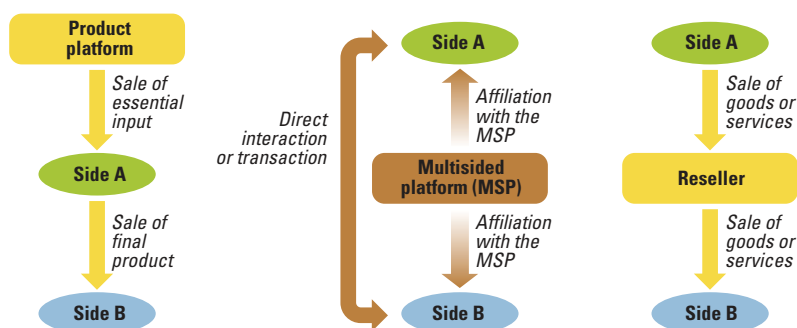
Cross-side network effects alone do not guarantee high barriers to entry. For an MSP to keep rivals and new entrants at bay, high switching costs or high costs to belong to more than one competing network are also necessary on one or all sides of the MSP.⁴ A cautionary tale is provided by Groupon and LivingSocial, the early leaders of the market for daily deals. Both are MSPs that connect merchants with consumers. And both exhibit clear cross-side network effects: The more users sign up to receive Groupon daily offers in the Boston area, the more attractive it becomes for Boston-based merchants to offer deals through Groupon, and vice versa.

Many investors assumed that these cross-side network effects would lead to market dominance, which propelled Groupon and LivingSocial to lofty valuations in record time. Groupon’s market capitalization was more than \$16 billion shortly after its IPO in November 2011, while LivingSocial was said to have been valued at about \$6 billion in a December 2011 private-funding round. By February 2013, those valuations had been slashed dramatically — Groupon’s to less than \$4 billion and LivingSocial’s to about \$1.5 billion⁵ — as analysts and investors realized that the low switching costs on both sides of this market — and ease of participating in more than one MSP — left the door open for many daily deal sites to compete. For instance, a 2011 news article reported that there were 33 daily deal sites in Boston and that competition had cut into both consumers’ and businesses’ loyalty to Groupon.⁶

Many, but not all, MSPs also exhibit economies of scale — their average cost of serving a customer (on a given side) or of enabling an individual transaction declines with the total number of customers that participate or transactions that are enabled. This is a common property of many software MSPs, simply because they typically have high up-front (fixed) development costs and low or zero marginal

HOW MULTISIDED PLATFORMS DIFFER FROM PRODUCT PLATFORMS AND RESELLERS

There are two key characteristics of a multisided platform: (1) each group of participants (“side”) are customers of the MSP in some meaningful way, and (2) the MSP enables a direct interaction between the sides. Product platforms violate the first requirement: The ultimate customer is not a customer of the platform provider. Resellers violate the second requirement: There is no direct interaction between the sides.



costs when they add users.⁷ Economies of scale can raise significant barriers to entry. For instance, the Microsoft Windows operating system has huge economies of scale due to its large up-front development costs.⁸ The combination of these economies of scale with strong cross-side network effects between users and application developers has made Windows one of the most valuable franchises in business history, and explains why its position has been so hard to assail for more than 30 years.

STRATEGY CHALLENGE NO. 1: How Many Sides to Bring on Board?

The first basic question that executives of any would-be MSP should ask is this: How many sides should we bring on board our platform? In some cases, the answer is obvious and constrained by the choice of industry; for instance, eBay did not have to think too hard before identifying buyers and sellers as its relevant sides. Sometimes, however, MSPs face a real choice when it comes to the number and identity of the sides to attract.

The following examples illustrate some of the pros and cons of courting more versus fewer sides:

- LinkedIn, the world's leading professional networking service, currently runs a three-sided platform that connects individual users (professionals), recruiters and advertisers. The company derives significant revenues from all three sides; by the end of 2011, 20% of revenues came from premium subscriptions, 30% from advertising solutions and 50% from recruiting solutions.⁹ The company is currently attempting to attract two additional sides: corporate users (company HR departments that would set up LinkedIn profiles to interact with their employees) and application developers. The challenge is that some individual users might not welcome the presence of corporate users (their employers) and that applications would have to be strictly restricted to a professional context (in other words, no Facebook-style games). Thus, while adding two more sides could potentially help LinkedIn grow, it also increases the risk of friction between the multiple sides and thereby LinkedIn's costs of operation.

- In the personal computer industry, Microsoft runs Windows as a three-sided platform, connecting

ABOUT THE RESEARCH

This article is part of the author's broader research agenda on multisided platform business models. It draws on more than 10 in-depth case studies developed as teaching vehicles during the past five years; direct advisory work with several technology companies (startups as well as large incumbents) seeking to implement multisided platform strategies; and formal economic modeling. My case studies were field-based and involved one or two days of interviews with top management teams. They aimed to (1) identify the price and especially nonprice strategic instruments that multisided businesses have at their disposal, and (2) formulate strategic options for dealing with challenges specific to multisided platforms, such as solving the chicken-and-egg problem and managing conflicting interests among various sides. My formal modeling work aims to capture the fundamental mechanisms at play in multisided businesses and provide predictions of optimal strategies. Predictions are then compared and reconciled with insights derived from case studies and advisory work.

users, third-party application developers (such as Adobe and Intuit) and third-party hardware manufacturers (OEMs such as Dell, Hewlett-Packard and Toshiba). In contrast, Apple has always stuck to a two-sided model — users and application developers — while producing its own hardware.¹⁰ Microsoft's strategy generated a larger ecosystem, which overwhelmed Apple's and relegated Macintosh computers to a much smaller PC market share than Windows-based PCs, despite Macintosh's allegedly superior design.

- A similar battle is now under way in the smartphone industry between Google's three-sided Android platform and Apple's two-sided iOS. At the end of 2012, Android devices accounted for 70% of the smartphone market share worldwide, whereas the iPhone had a 21% market share.¹¹ The two platforms were essentially tied on the developer side, with more than 800,000 applications available on each.¹² However, the iOS platform remains more profitable for third-party developers than Android, perhaps because Apple's devices typically command higher consumer loyalty and because iPhone users tend to spend more on apps than Android users do.

- When Microsoft first sought to enter the video game industry with its Xbox, which launched in 2001, it failed in its attempt to “copy and paste” its three-sided platform model from the PC industry. Hardware manufacturers like Dell declined Microsoft's proposal to produce Xbox consoles in exchange for a licensing fee, pointing out that video game consoles are sold below cost and money is made through the sale of games, and that it would

therefore be impossible for any standalone hardware OEM to make positive margins in the video game industry. As a result, Microsoft had to produce the consoles for the Xbox itself (as Nintendo and Sony do) and thus conform to the two-sided platform model that had prevailed in the industry for more than 15 years.

Looking at these examples, the trade-off involved in choosing whether to attract more or fewer sides becomes apparent. More sides lead to potentially larger cross-side network effects (as with Windows), larger scale and potentially diversified sources of revenues (as with LinkedIn). But there are at least two good reasons for staying with fewer sides. First, it may not be economically viable for one (or several) sides to exist independently. As described above, console hardware production cannot be profitable as a separate entity in the video game industry, which means that it has to be integrated with the same entity as the console operating system. Second, even if attracting many sides is possible, doing so carries the risk of creating too much complexity and even conflicts of interest between the multiple sides and the MSP (as with LinkedIn's efforts to attract employers as a new side).

Adding more sides can also cause a "lowest common denominator" issue, in that the need to please many different and heterogeneous platform constituents greatly constrains an MSP's ability to innovate by introducing truly ground-breaking features. Apple's control over its own Macintosh hardware limits scale but allows Apple to produce higher quality hardware-software systems. In contrast, Microsoft Windows has always been constrained by its OEM partners. In an interesting and recent shift, Microsoft has moved into hardware with its Surface tablet and acquisition of Nokia's handset business. These events could arguably be interpreted as an implicit admission that Microsoft's long-standing three-sided model is reaching its limits.

Finally, even if it makes sense to attract more sides in the long run, some MSPs find it easier to solve the initial chicken-and-egg problem by starting with fewer sides and at least partially vertically integrating into some of the "missing" sides. For example, Palm started off essentially as a one-sided product company when it launched its Pilot PDA

device in 1996 before turning it into a two-sided, then three-sided, platform by attracting third-party application developers and PDA hardware licensees.¹³ In another example, all major video game console manufacturers now operate their own development studios in order to produce first-party games (content) exclusive to their respective consoles, which is critical at every new console launch.¹⁴ Furthermore, partial vertical integration presents the opportunity to reap higher returns by owning some of the most profitable complementary products or services. But such selective vertical integration might be a disincentive for third-party players to join if they perceived a risk of competition from the MSP owner.

STRATEGY CHALLENGE NO. 2: Multisided Platform Design

MSPs can encompass a tremendous variety of functionalities and features that reduce search costs (Airbnb and Match.com provide search functionality based on desirable characteristics), transaction costs (eBay offers buyers and sellers the ability to settle transactions using PayPal) or product development costs (Sony provides application programming interfaces and development kits that facilitate game development for the PlayStation 3). For most of these features, the decision whether to include them is amenable to a straightforward cost-benefit analysis: If the cost of building and implementing is less than the value created for the multiple sides served, include them.

Nevertheless, there is still scope for expensive mistakes. For instance, eBay's acquisition of PayPal in 1999 greatly reduced transaction costs between its buyers and sellers by offering a reliable and convenient way to settle transactions. In the first quarter of 2013, the PayPal unit generated \$1.5 billion of the \$3.7 billion in revenues for eBay as a whole.¹⁵ In contrast, eBay's 2005 acquisition of Skype created much less value for buyers and sellers than the price paid (\$2.6 billion). Many users were turned off by the availability of voice communications, which they viewed as putting unnecessary pressure on the comfortable anonymity of Internet transactions. Two years later, eBay had to write off \$1.39 billion related to the Skype acquisition.¹⁶

The most difficult MSP design decisions are

those that involve features putting the interests of different sides of the MSP at odds with each other or with those of the MSP. Such features create strategic trade-offs for the MSP because they generate positive value for some participant groups or for the MSP itself, but negative value for other participant groups. These can be difficult trade-offs to navigate, even without taking into account the cost of building and implementing the features in question.¹⁷ Examples include the following:

- Any advertising-supported medium (such as magazines, over-the-air television channels, search engines or social networks) must constantly balance advertisers' desire to expose users to more numerous, prominent and targeted advertisements with users' preference for less intrusion.¹⁸ Microsoft, for example, included a do-not-track feature in Internet Explorer 9, which made it easier for users of that Web browser to protect their online privacy and harder for advertisers to reach them. This move was a significant departure from the design of Internet Explorer 8, in which the do-not-track feature had been suppressed under pressure from online advertisers and content providers.¹⁹

- In 2010, eBay discontinued its AdCommerce and Featured First advertising programs, which allowed some sellers to pay in order to appear at the top of buyers' eBay search results. These programs had been very popular with sellers and were an additional source of revenue for eBay, aside from listing fees.²⁰ In the end, however, eBay decided to ensure that buyers always saw the most relevant product listings.

How should MSPs resolve such conflicts between the interests of their various participant groups? There are no easy answers; sometimes, as illustrated by the examples above, MSPs must be ready to make sacrifices with direct short-term revenue impact in order to not alienate the participants whose utility is decreased by the design features in question. In particular, it would be a mistake to assume that design decisions should be made in favor of the side that brings in the largest share of *current* revenues. A better principle would be to consistently solve trade-offs in favor of the participant group that is most important to the MSP's long-term success. In any event, assessing the trade-off between the interests of the various groups associated with every significant design decision can go a long way toward reducing the risks of irreversible design mistakes or the costs of the design experimentation process.

STRATEGY CHALLENGE NO. 3: Multisided Platform Pricing Structures

Because MSPs serve multiple types of customers, they potentially have multiple revenues and profit sources. In reality, however, most MSPs have discovered that they have to offer their services for free or at subsidized prices to at least one side of the platform and derive their profits on the other side.²¹ (See "Pricing Structures for Multisided Platforms.")

How should MSPs choose their pricing structures — how much should they charge each side relative to the others? Pricing structures have been

PRICING STRUCTURES FOR MULTISIDED PLATFORMS

Many multisided platforms have discovered that they have to offer their services for free or at subsidized prices to at least one side of the platform and derive their profits on the other side.

MULTISIDED PLATFORM	LOSS-LEADER SIDE	PROFIT-MAKING SIDE
Advertising-supported media (newspapers, over-the-air TV networks, Facebook, Google)	Users	Advertisers
Alibaba.com, eBay, Rakuten	Buyers	Sellers
Payment systems (American Express, Visa, Square)	Users	Merchants
Video game consoles	Users	Game developers
PC operating systems (Windows, Mac OS)	Application developers	Users
Ticketmaster	Venues/event organizers	Users
Fandango	Movie theaters	Users

the first and dominant focus of the economics and strategy work on MSPs to date.²² The pricing principles most useful to business executives are summarized below:

1. For each group, charge a higher price when the group in question has less price sensitivity.

This simple pricing principle applies to any product or service. Here, it relies on treating each side of a multisided platform independently of the others. The price sensitivity on any given side of an MSP can be estimated by the availability of substitute services — or simply by the bargaining power that the MSP has over that particular participant group.

2. If there is no priced transaction between the sides, then charge more to the side that stands to benefit more from the presence of the other side or sides. The logic behind this principle is specific to MSPs, but also straightforward. For example, business conference organizers typically charge attendees but not invited speakers.

3. If there is a priced transaction between two sides, then charge more to the side that can extract more value from the other side. If side A gets a particularly good deal from side B in a monetary transaction, the MSP should charge more to side A in order not to excessively penalize side B; otherwise, side B might not derive enough value from the MSP to warrant participation. For instance, OpenTable offers a Web-based service matching diners with restaurants. It charges restaurants a fee to book online reservations and charges nothing to consumers. The logic is that restaurants derive significant value from diners' visits by selling them full-priced meals. MSPs should choose their pricing structures so as to optimally balance value extraction and value creation on their multiple sides. In general, customer groups that derive higher value should be charged more.

STRATEGY CHALLENGE NO. 4:

Multisided Platform Governance Rules

As MSPs create value by facilitating interactions between third parties, a key part of their strategy should be some regulation of third-party actions, which clearly affect the value of the MSP's entire ecosystem and customer proposition.²³ MSPs can regulate their various customers by resorting to

nonprice *governance rules*, which fall into two major categories:

- Rules regulating *access* to the MSP: Who is allowed to join?
- Rules regulating *interactions* on the MSP: What are the various sides allowed to do?

There is considerable variance across MSPs in terms of how loose (or tight) their governance rules are — even within the same industry, as seen below:

•Match.com and eHarmony are two of the leading online dating services in the United States.²⁴ Match.com places minimal restrictions on who can sign up and how its members interact; eHarmony has some of the tightest governance rules among online matchmaking services, for both access and interactions. It screens applicants by requiring them to complete a questionnaire of approximately 250 questions and then refusing membership to some applicants, even if they are willing to pay the membership fee.²⁵ Once granted admission, eHarmony's MSP members are not allowed to view profiles and communicate freely. Instead, the company uses a matching algorithm to generate potential matches for every member, and each member can communicate only with her or his potential matches. Furthermore, communication is initially guided by eHarmony's questions unless both members agree to "fast track" to open communication.

•In 1983, the video game market crashed, mainly because Atari — the dominant console manufacturer at the time — had failed to develop a technology for locking out unauthorized games. Opportunistic developers, wanting to take advantage of the popularity of Atari's console to make quick profits, flooded the market with poor-quality games. This, combined with a lack of information about game quality (at the time, there were almost no specialized game review magazines), led to a collapse of game and console prices. Not surprisingly, when Nintendo reignited the market with its Nintendo Entertainment System console, it put in place draconian governance rules: Any individual game developer was allowed to publish no more than five games a year (each of which was carefully reviewed by Nintendo), and developers had to buy cartridges from Nintendo, so that the latter also effectively controlled sales of each game. As a result of an antitrust investigation in the early 1990s and competition from Sega,



Multisided platform executives should ask: What are the ‘market failures’ that would prevent our ecosystem from functioning properly (or even lead to its collapse) and that we cannot eliminate through pricing?

which employed more liberal governance rules, Nintendo subsequently abandoned most of its restrictions. One exception was the screening of third-party games, which all major console manufacturers still do today, although Nintendo remains a stricter MSP than Sony and Microsoft.

•In the smartphone market, the two leading MSPs differ significantly in their governance rules. Apple places relatively tight restrictions on third-party developers for its iOS two-sided platform, while Google is much more liberal with respect to developers for its three-sided Android platform. For example, Google allows developers to use a variety of third-party tools in building their Android apps and accepts most new apps. But developers for Apple’s iOS are restricted to a fixed set of Apple-supplied tools. Furthermore, approval of new apps takes several weeks in Apple’s iPhone App Store, and Apple routinely rejects applications that it does not deem of satisfactory quality or simply a “good fit” for the iPhone. (Unsurprisingly, Apple’s criteria are viewed as arbitrary by some developers.²⁶)

•Roppongi Hills, Tokyo’s best-known real-estate complex, functions as an MSP, bringing together office tenants, retail tenants (shops and restaurants, a hotel, a movie theater), residents and more than 40 million visitors a year. Mori Building Company, developer and manager of the complex, has put in place a set of unusually demanding policies for its retail tenants. For example, they are required to differentiate their offerings from their other storefronts outside Roppongi Hills by keeping the stores open later and selling unique merchandise, and they are also required to contribute financial and human resources to promotional activities spanning the entire complex.²⁷

At a high level, an MSP’s choice of tighter governance rules reflects a trade-off of *quantity* in favor of *quality*. Indeed, the strength of cross-side network effects on an MSP is not solely determined by

the number of members on its respective sides and the number of interactions they engage in, but also by their quality.

The benefits of higher quality have to be weighed against the costs of implementing tighter governance rules. These costs can be technological (such as designing and including security chips for video game consoles to lock out unauthorized games) or operational (such as analyzing the profiles of individual applicants to eHarmony’s service). Thus, if quantity “crowds out” quality to a limited extent, some MSPs might find it optimal to do away with costly governance rules or to “out-source” their enforcement to users. For instance, e-commerce sites such as Airbnb and eBay have put in place rating systems for buyers and sellers, which tend to keep both sides honest.

Generally speaking, some form of MSP governance is indispensable. MSP executives should ask: *What are the “market failures” that would prevent our ecosystem from functioning properly (or even lead to its collapse) and that we cannot eliminate through pricing?* As discussed in the previous section, MSPs can, to a certain extent, correct imbalances in supply and demand or relative bargaining power by adjusting their pricing structures. Furthermore, pricing can sometimes have additional governance benefits, such as restricting entry of undesirable constituents. For example, the per game copy royalty charged by video game console makers to independent game developers serves not just as the console makers’ main revenue stream but also as a disincentive for low-quality game developers to participate.

There are three potential sources of market failures that warrant active governance by the MSP. First, insufficient information and transparency in the market with respect to the quality of the goods and services exchanged through the MSP may lead to a “lemons market failure,” in which low-quality suppliers drive out high-quality ones and the market

breaks down. The 1983 video games crash provides a vivid illustration of this phenomenon. eHarmony's stringent governance rules can also be viewed as an effort to prevent such a failure, in which users with short-term dating interests would drive away users looking for long-term relationships and marriage. (eHarmony caters to the latter.)

The second potential source of MSP market failure is the risk that too much competition within one side of an MSP might reduce the incentive to invest in developing high-quality products or services. This is the main reason that video game console makers maintain relatively tight control over access by third-party game developers even today. Even though the risk of a 1983-type market failure is no longer present because of the abundance of information and reviews about upcoming games, excessive competition between developers on any given console could reduce the profits that each developer can extract, to the point where they may no longer find it profitable to invest in groundbreaking projects. As a result, the MSPs (console makers) restrict entry of developers so that those who are licensed are able to make a sufficient return on their investments.²⁸

Third, without some form of strict governance by the MSP, each constituent might fail to take actions or investments that would have positive spillover effects for the MSP and its other constituents. This is the main reason behind Mori Building's tight governance rules on its Roppongi Hills development. The rules are designed to exploit positive complementarities between retail tenants, which might not materialize if the latter were left to decide independently.

Whenever one or more of these three potential sources of market failures are present, MSPs are well-advised to consider enforcing governance rules that target the source of the specific market failure or failures in question.

Successful Multisided Platforms Are the Exception

Increasing awareness of the power of MSP business models and the spectacular MSP successes from the past decade have prompted many entrepreneurs and investors to attempt building or identifying "the next eBay." Recent examples include Getaround and RelayRides (peer-to-peer car rental services); DogVacay (boarding for dogs); and Kitchit (chef-hiring service). It is important to realize, however, that successful MSPs are the exception rather than the norm.

Indeed, MSPs are very hard to build. There are three main obstacles that trip up most MSP candidates:

1. the chicken-and-egg problem inherent in launching an MSP business;
2. resistance from key potential MSP constituents, who do not want to be beholden to a new and powerful MSP; and
3. the sheer complexity of running an MSP business with conflicting interests to satisfy.

The experience of Brightcove, a Boston-based leading provider of online video technologies, provides a cautionary tale illustrating many of these issues.²⁹ When it was founded in 2004, Brightcove aimed to become a four-sided platform connecting video content providers (from large publishers such as MTV Networks, Discovery Communications and The Wall Street Journal to small, "long-tail" ones, such as Shipwreck Central), advertisers, Web affiliates and end users (viewers). Specifically, Brightcove intended to provide (1) video publishing tools to content providers; (2) a video portal for consumers to search, view and purchase content from publishers; (3) an advertising marketplace in which content providers and advertisers would trade video advertising space; and (4) a syndication marketplace, where content providers and affiliated websites would trade video content. After two years, however, it became increasingly

The spectacular multisided platform successes from the past decade have prompted many entrepreneurs or investors to attempt building or identifying 'the next eBay.'



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clear that this ambitious four-sided vision was off the mark. The key issue was that the content-provider side (large publishers in particular) viewed Brightcove as competing against their efforts to attract consumers and advertisers to their websites. Furthermore, Brightcove discovered that it was very hard to allocate sufficient resources to serve four different types of customers simultaneously.

The good news is that the difficulty of an MSP business does not necessarily rule out the possibility of building a solid non-MSP business. By late 2008, Brightcove had almost entirely abandoned its consumer-facing portal as well as its advertising and syndication marketplaces and had decided to focus simply on one side, supplying video publishing tools to content providers. The company went public in February 2012 and had a market cap of more than \$400 million at the end of October 2013. This is a respectable valuation, but not exactly what Brightcove initially had in mind. After all, Airbnb was valued at about \$2.5 billion in its private funding round in October 2012. That's the gold at the end of the MSP rainbow that many seek.

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MSPs include some but not all the "industry platforms"

studied by Gawer and Cusumano (2008). Many industry platforms, such as Windows and PlayStation 3, are MSPs because they enable direct interactions between users and game or application developers. In particular, my requirement of direct interactions is aligned with the notion that industry platforms do not fully control what third parties do or build on their platforms. On the other hand, some industry platforms are not MSPs: they are equivalent to the product platforms in Boudreau and Lakhani (2009). One example is the electronic ink technology developed by E Ink, which is the key component in Amazon's Kindle and other e-readers. E Ink functions merely as a component supplier to Amazon and others. Note, however, that the Kindle is an MSP: It allows Kindle users to buy and read e-books supplied by independent publishers. Both sides (users and publishers) affiliate with Amazon's Kindle, not with E Ink. Principles for dethroning incumbent platforms apply to MSPs as well as to non-MSP product platforms, such as E Ink.

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