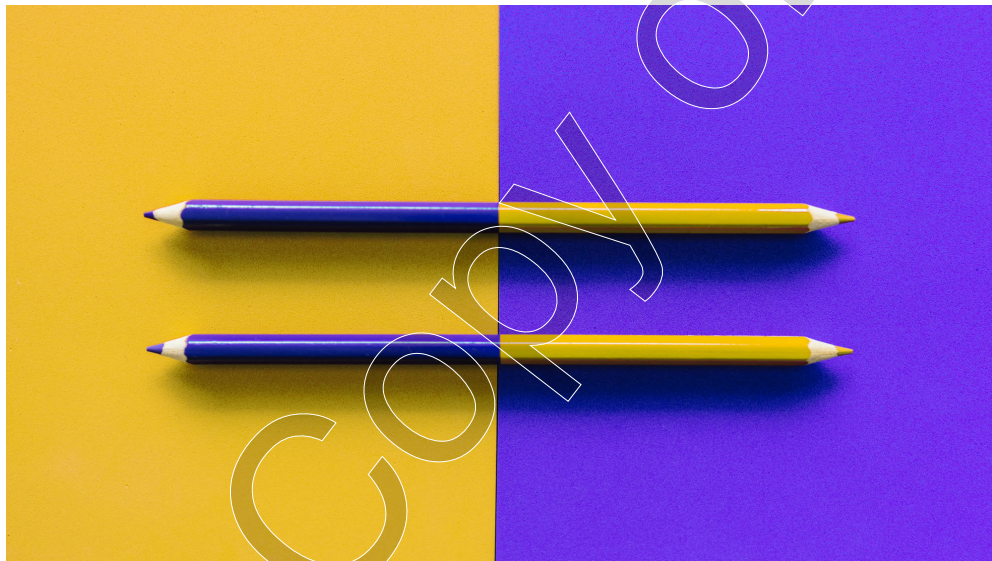Strategic Planning

Strategies for Two-Sided Markets

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by Tom Eisenmann, Geoffrey G. Parker, and Marshall W. Van Alstyne

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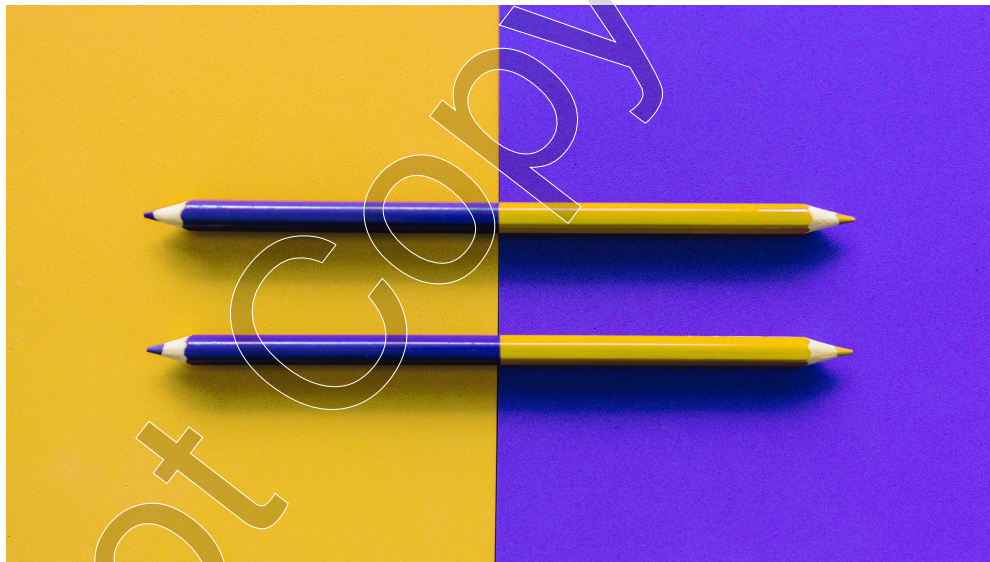
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If you listed the blockbuster products and services that have redefined the global business landscape, you'd find that many of them tie together two distinct groups of users in a network. Case in point: What has been the most important innovation in financial services since World War II? Answer: almost certainly the credit card, which links consumers and merchants. Newspapers, HMOs, and computer operating systems also

serve what economists call *two-sided markets* or *two-sided networks*. Newspapers, for instance, join subscribers and advertisers; HMOs link patients to a web of health care providers, and vice versa; operating systems connect computer users and application developers.

Products and services that bring together groups of users in two-sided networks are *platforms.* They provide infrastructure and rules that facilitate the two groups' transactions and can take many guises. In some cases, platforms rely on physical products, as with consumers' credit cards and merchants' authorization terminals. In other cases, they are places providing services, like shopping malls or Web sites such as Monster and eBay.

Two-sided networks can be found in many industries, sharing the space with traditional product and service offerings. However, two-sided networks differ from other offerings in a fundamental way. In the traditional value chain, value moves from left to right: To the left of the company is cost; to the right is revenue. In two-sided networks, cost and revenue are both to the left and the right, because the platform has a distinct group of users on each side. The platform incurs costs in serving both groups and can collect revenue from each, although one side is often subsidized, as we'll see.

The two groups are attracted to each other—a phenomenon that economists call the network effect. With two-sided network effects, the platform's value to any given user largely depends on the number of users on the network's other side. Value grows as the platform matches demand from both sides. For example, video game developers will create games only for platforms that have a critical mass of players, because developers need a large enough customer base to recover their upfront programming costs. In turn, players favor platforms with a greater variety of games.

Because of network effects, successful platforms enjoy increasing returns to scale. Users will pay more for access to a bigger network, so margins improve as user bases grow. This sets network platforms apart from most traditional manufacturing and service businesses. In traditional businesses, growth beyond some point usually leads to diminishing returns: Acquiring new customers becomes harder as fewer people, not more, find the firm's value proposition appealing.

Fueled by the promise of increasing returns, competition in two-sided network industries can be fierce. Platform leaders can leverage their higher margins to invest more in R&D or lower their prices, driving out weaker rivals. As a result, mature two-sided network industries are usually dominated by a handful of large platforms, as is the case in the credit card industry. In extreme situations, such as PC operating systems, a single company emerges as the winner, taking almost all of the market.

> **In traditional value chains, value moves from left to right: To the left of the company is cost; to the right is revenue. In two-sided networks, cost and revenue are both to the left and the right.**

Platforms serving two-sided networks are not a new phenomenon. Energy companies and automakers, for example, link drivers of gasoline-powered cars and refueling stations in a well-established network. However, thanks largely to technology, platforms have become more prevalent in recent years. New platforms have been created (Google, for example, links advertisers and Web searchers) and traditional businesses have been reconceived as platforms (for instance, retail electricity markets are evolving into platforms that

match consumers with specific power producers, allowing them to express their preferences for cheaper coal or more costly renewable power). Yet for all the potential they've spotted, platform providers have struggled to establish and sustain their two-sided networks. Their failures are rooted in a common mistake. In creating strategies for two-sided networks, managers have typically relied on assumptions and paradigms that apply to products *without* network effects. As a result, they have made many decisions that are wholly inappropriate for the economics of their industries.

In the following article, we draw on recent theoretical work[1] to guide executives in negotiating the challenges of two-sided networks. We begin by looking at the factors that senior managers must consider in designing their platforms' business models. The key decision here is pricing. As we've noted, providers of platforms for two-sided networks are able to draw revenue from both sides. In most cases, though, it makes sense to subsidize certain users. The crucial strategy question is, Which side should you subsidize, and for how long?

The next step is to figure out how to manage winner-take-all dynamics. Many two-sided network industries are served almost entirely by a single platform. In some cases, just one company controls that platform, as with eBay's auctions or Microsoft's Windows. In other cases, multiple companies share the dominant platform, as with DVD and fax standards or, in real estate, a regional multiple listing service. (See the exhibit "Examples of Two-Sided Networks.") When a network industry is likely to be served by a single platform, aspiring providers must make a "bet the company" decision. Should they fight to gain proprietary control over the platform or share the spoils with rivals?

Examples of Two-Sided Networks

Insights about the economics of two-sided networks apply to a variety of industries. In cases where platforms—the products and services that bring together groups of users—are proprietary, there invariably is a clear subsidy side and a clear money side. For example, doctors—in exchange for access to a higher volume of patients—agree to rates below those they could command if they were not affiliated with an HMO.

Networks served by shared platforms tend to lack a subsidy side. It is hard for platform providers to recover subsidies if rivals share the fees collected from the network's money side. Real estate brokers avoid this free-rider problem by splitting the seller's fee 50/50. Subsidies also disappear when a shared platform's providers do not have pricing power on both sides of the network, as in the case of gasoline-powered transportation.

Networked market	Side 1	Side 2	Rival platform providers
PC Operating Systems	Consumers	Application developers*	Windows, Macintosh *(proprietary platforms)*
Online recruitment	Job seekers*	Employers	Monster, CareerBuilder *(proprietary platforms)*
Miami Yellow Pages	Consumers*	Advertisers	BellSouth, Verizon *(proprietary platforms)*
Web search	Searchers*	Advertisers	Google, Yahoo *(proprietary platforms)*
HMOs	Patients*	Doctors	Kaiser, WellPoint *(proprietary platforms)*
Video Games	Players*	Developers	PlayStation, Xbox *(proprietary platforms)*
Minneapolis shopping malls	Shoppers*	Retailers	Mall of America, Southdale Center *(proprietary platforms)*
Linux application servers	Enterprises	Application developers	IBM, Hewlett-Packard, Dell *(shared platforms)*

Networked market	Side 1	Side 2	Rival platform providers
Wi-fi equipment	Laptop users	Access points	Linksys, Cisco, Dell *(shared platforms)*
DVD	Consumers	Studios	Sony, Toshiba, Samsung *(shared platforms)*
Phoenix Realtors Association	Homebuyers*	Home sellers	100+ real estate brokerage firms *(shared platforms)*
Gasoline-powered engines	Auto owners	Fueling stations	GM, Toyota, Exxon, Shell *(shared platforms)*
Universal Product Code	Product suppliers	Retailers	NCR, Symbol Technologies *(shared platforms)*

* Denotes network's subsidy side ▽**HBR**

Platform providers that have vanquished their immediate rivals can't rest on their laurels. Indeed, they face a significant competitive threat from large companies operating in adjacent markets that have the ability to offer a multiplatform bundle. In our final section, we explore this challenge and offer prescriptions for firms that face it. As we'll see, moving first and getting big quickly aren't necessarily the right answers.

Challenge 1: Pricing the Platform

In competitive industries, prices are largely determined by the marginal cost of producing an extra unit, and margins tend to be thin. In industries with high barriers to entry, the price ceiling is set by customers' willingness to pay, and margins are more likely to be fat.

For two-sided networks, pricing is a more complicated affair. Platform providers have to choose a price for each side, factoring in the impact on the other side's growth and willingness to pay. Typically, two-sided networks have a "subsidy side," that is, a group of users who, when

attracted in volume, are highly valued by the "money side," the other user group. Because the number of subsidy-side users is crucial to developing strong network effects, the platform provider sets prices for that side below the level it would charge if it viewed the subsidy side as an independent market. Conversely, the money side pays more than it would if it were viewed as an independent market. The goal is to generate "cross-side" network effects: If the platform provider can attract enough subsidy-side users, money-side users will pay handsomely to reach them. Cross-side network effects also work in the reverse direction. The presence of money-side users makes the platform more attractive to subsidy-side users, so they will sign up in greater numbers. The challenge for the platform provider with pricing power on both sides is to determine the degree to which one group should be encouraged to swell through subsidization and how much of a premium the other side will pay for the privilege of gaining access to it.

Pricing is further complicated by "same-side" network effects, which are created when drawing users to one side helps attract even more users to that side. For example, as more people buy PlayStation consoles, new users will find it easier to trade games with friends or find partners for online play. Economists call this snowballing pattern a positive same-side network effect. (Same-side network effects can also be negative. For a more detailed explanation of how network effects attract or deter users, see the sidebar, "The Dynamics of Two-Sided Networks.")

It is not always obvious which side—if either—the platform should subsidize and which it should charge. During the dot-com boom, for example, nascent B2B exchanges agonized over whether to charge fees to buyers, sellers, or both, and how charges should be split between fixed subscription payments and variable transaction fees. (See the sidebar "Similar Networks, Different Pricing" for an illustration of how

two seemingly similar networks may require very different pricing strategies.)

To make the right decisions about pricing, executives of platform providers need to look closely at the following factors:

The Dynamics of Two-Sided Networks

Transactions in two-sided networks always entail a triangular set of relationships. Two user groups—the network's "sides"—interact with each other through one or more intermediaries called *platform providers*. A *platform* embodies an *architecture*—a design for products, services, and infrastructure facilitating network users' interactions—plus a set of *rules;* that is, the protocols, rights, and pricing terms that govern transactions. These platforms exhibit two types of network effects, which may be either positive or negative: A same-side effect, in which increasing the number of users on one side of the network makes it either more or less valuable to users on the same side; and a cross-side effect, in which increasing the number of users on one side of the network makes it either more or less valuable to the users on the other side. Cross-side network effects are typically positive, but they can be negative (TV viewers preferring fewer ads). Same-side network effects are often negative (sellers preferring fewer rivals in a B2B exchange), but they may be positive (Microsoft Xbox owners valuing the fact that they can play games with friends).

Similar Networks, Different Pricing

On first inspection, PC and video game networks look similar. In both cases, end users on one side wishing to link to software or games on the other side buy a platform consisting of an operating system (OS) bundled with hardware—a PC or a game console. The two businesses exhibit similarly positive cross-side network effects: End users favor platforms that offer a wide variety of complements. Developers favor platforms with more end

users because this improves the odds that they will recover the fixed, upfront costs of creating complements.

Notwithstanding these similarities, the PC and game industries use very different pricing models. In video games, end users are subsidized. Platform providers like Sony PlayStation and Microsoft Xbox historically have priced consoles at or below cost. Game developers are on the network's money side; they pay a royalty to console manufacturers of as much as 20% of a game's retail price. In the PC industry, the money side and subsidy side are reversed. End users are the money side, paying well above cost for the platform's essential element—its OS—which comes bundled with PCs offered by OEMs like Gateway. Application developers are the subsidy side. They pay no royalties and receive free software development kits from the OS vendors.

Why do these similar two-sided networks have fundamentally different pricing structures? Video game consoles users—typically teenagers—are both far more price sensitive and quality conscious than typical PC users. On average, each console owner buys just eight games, which cost about $50 apiece. Over the two- to three-year life of a console, these precious titles are consumed sequentially in intense bursts; gamers spend a great deal of time—40 to 100 hours—with each title.

To deliver compelling quality, game developers incur enormous fixed costs. To amortize these costs, they must be assured that the console has many users: Hence the need for a consumer subsidy. Console providers police quality by imposing strict licensing terms and charging a high royalty. This "tax," absorbed by the developers, helps weed out games of marginal quality. Developers cannot afford to offer titles with weak sales prospects, once the tax is added to their price.

By contrast, PCs are often purchased for work and are otherwise more likely viewed as household necessities than game consoles are, so price sensitivity is lower. Over their lives, PCs accumulate scores of applications, ranging from the indispensable (such as word processing) to the disposable (for example, some casual games). Accordingly, we observe a huge range of price and quality levels for applications.

It's true that both PC users and gamers value variety and quality and that developers in both networks value the ability to reach a large installed base. However, gamers' need for quality seems to be stronger, as does game developers' need for large numbers of consumers.

Ability to capture cross-side network effects. Your giveaway will be wasted if your network's subsidy side can transact with a rival platform provider's money side. That's what happened to Netscape, which subsidized its browser to individuals in the hope of selling Web servers to companies operating Web sites. However, Web site operators didn't have to buy Netscape's server in order to send pages to Netscape's big base of users; they could buy a rival's Web server instead.

User sensitivity to price. Generally, it makes sense to subsidize the network's more price-sensitive side and to charge the side that increases its demand more strongly in response to the other side's growth. Adobe's Acrobat software follows this pricing rule. Acrobat presents any electronic document in Portable Document Format (PDF), a universal standard that can be printed or viewed exactly as it appeared in its original application. The PDF network consists of two sets of users— writers, who create documents, and readers, who view them—using different software. Readers are very price sensitive; they pay nothing for their software. If readers were charged even a small amount, Adobe Reader's 500-million-person user base would be much smaller. Writers, who greatly value this huge audience, pay a fee for their software. If Adobe reversed its approach, charging readers and subsidizing writers, its network would collapse. Writers are less price sensitive, so free software would not dramatically boost their numbers. More to the point, readers would not pay much for access to a bigger base of writers.

User sensitivity to quality. High sensitivity to quality also marks the side you should subsidize. This pricing prescription can be counterintuitive: Rather than charge the side that strongly *demands* quality, you charge the side that must *supply* quality. Such a strategy is evident in video games. To deliver compelling quality, game developers incur enormous fixed costs. To amortize these costs, they must be assured that the platform has many users. Hence the need for a consumer subsidy. Platform providers make sure game developers meet high quality standards by imposing strict licensing terms and charging a high royalty. This "tax" is not passed through to consumers: Developers charge the highest prices the market will bear, regardless of the royalty rate. However, the royalty helps weed out games of marginal quality. Once the "tax" is added, titles with poor sales prospects cannot generate enough contribution margin to cover their fixed costs, so they never get made in the first place.

Output costs. Pricing decisions are more straightforward when each new subsidy-side user costs the platform provider essentially nothing. This will be the case when the giveaway takes the form of a digital good such as a software program or a cheap service such as otherwise-idle computer time. However, when a giveaway product has appreciable unit costs, as with tangible goods, platform providers must be more careful. If a strong willingness to pay does not materialize on the money side, a giveaway strategy with high variable costs can quickly rack up large losses. FreePC learned this lesson in 1999 when it provided computers and Internet access at no cost to consumers who agreed to view Internet-delivered ads that could not be minimized or hidden. Unfortunately, few marketers were eager to target consumers who were so cost conscious. FreePC abandoned its offer after incurring $80 million in losses.

Same-side network effects. Surprisingly, sometimes it makes sense to deliberately exclude some users from the network. Platform providers normally welcome growth in the user base on either side, because it encourages growth on the other side. In addition to positive cross-side network effects, however, platform managers must assess the possibility of negative same-side network effects, which can be quite strong. In most markets, sellers would be happy to see fewer direct rivals; the same can be true for buyers when goods are scarce. For example, many auto parts manufacturers, concerned about downward pricing pressure, refused to participate in Covisint, a B2B exchange organized by auto manufacturers. Covisint stalled, as did many other B2B market makers that failed to recruit enough sellers. In the face of strongly negative same-side network effects, platform providers should consider granting exclusive rights to a single user in each transaction category—and extracting high rent for this concession. The platform manager then must make sure that sellers do not abuse their monopoly positions; otherwise, buyers will avoid the network. Online car-buying services like Autobytel, which forwards consumers' queries to a single dealer in any given geographic territory, have succeeded with this strategy. Autobytel has earned a modest profit over the past three years; more to the point, it survived the dot-com crash that extinguished many Internet market makers with flawed strategies.

Users' brand value. All users of two-sided networks are not created equal. The participation of "marquee users" can be especially important for attracting participants to the other side of the network. Marquee users may be exceptionally big buyers, like the U.S. government. Or they may be high profile suppliers, like anchor stores in malls. A platform provider can accelerate its growth if it can secure the exclusive participation of marquee users in the form of a commitment from them not to join rival platforms. For many years, this kind of exclusive arrangement was at the core of Visa's marketing campaigns ("...and

they don't take American Express"). Of course, it can be expensive—especially for small platforms—to convince marquee users to forfeit opportunities in other networks. When the participation of a few large users is crucial for mobilizing a network, conflict over the division of value between platform providers and large users is common. Microsoft learned this when Electronic Arts (EA)—the largest developer of video games and thus a major potential money-side user of Microsoft's Xbox platform—refused to create online, multiplayer versions of its games for the Xbox Live service. EA objected to Microsoft's refusal to share subscription fees from Xbox Live, among other issues. After an 18-month stalemate, EA finally agreed to offer Xbox Live games. Terms of the agreement were not made public, but at the time, Microsoft announced that it would halt the in-house development of new games that would compete with EA's flagship sports titles.

Failing to recognize that two-sided network pricing follows different rules than conventional businesses can sink even the most attractive platforms. Apple provides a cautionary tale about misapplied pricing logic. Apple's well-regarded Macintosh operating system has always commanded a price premium from consumers. When it launched the Mac, Apple also tried to extract rent from the other side of its network, charging third-party developers $10,000 for the software development kits (SDKs) required to create Macintosh applications. By contrast, Microsoft gave Windows SDKs away for free. Tellingly, by the time of Microsoft's antitrust trial, Windows had six times as many applications as Macintosh. This made Windows far more attractive to consumers, despite its functional shortcomings.

Challenge 2: Winner-Take-All Dynamics

The prospect of increasing returns to scale in network industries can lead to winner-take-all battles, so an aspiring platform provider must consider whether to share its platform with rivals or fight to the death.

Companies sometimes get this decision wrong, as with Sony's futile battle to establish its Betamax videocassette standard.

Coping with platform competition is a two-step process. First, executives must determine whether their networked market is destined to be served by a single platform. When this is the case, the second step —deciding whether to fight or share the platform—is a bet-the-company decision. The stakes are much higher when a networked market has room for fewer rival platforms.

Turning to the first step, a networked market is likely to be served by a single platform when the following three conditions apply:

- **Multi-homing costs are high for at least one user side.** "Homing" costs comprise all the expenses network users incur—including adoption, operation, and the opportunity cost of time—in order to establish and maintain platform affiliation. When users make a "home" on multiple platforms, they increase their outlays accordingly. For example, the vast majority of PC users rely on a single operating system—almost always Windows—because using multiple operating systems is expensive in terms of the additional hardware, software, and training required. Similarly, distance limits the number of shopping malls that consumers can visit at any one time, which in turn limits the number of malls. When multi-homing costs are high, users need a good reason to affiliate with multiple platforms.
- **Network effects are positive and strong—at least for the users on the side of the network with high multi-homing costs.** When cross-side network effects are positive and strong, those network users will tend to converge on one platform. A small-scale platform will be of little interest to users unless it is the only way to reach certain users on the other side. The odds of a single platform prevailing also increase

when same-side network effects are positive: for example, when users of a software program need to share files with one another.

- **Neither side's users have a strong preference for special features.** If certain users have unique needs, then smaller, differentiated platforms can focus on those needs and carve out niches in a larger rival's shadow. American Express, for example, earns high margins despite having issued only 5% as many credit cards as Visa. American Express cards have no preset spending limit—a valuable feature for business travelers, made possible because cardholders must pay their full balance every month. Visa cannot match this feature, because the loans it extends to cardholders put an upper limit on their spending. In cases where special features are not important, however, users will tend to converge on a single platform.

The DVD industry meets these three conditions. First, multi-homing costs are high for consumers because it would be expensive to buy multiple players. Likewise, multi-homing costs are high for studios: Having to provide the same content in multiple incompatible formats would increase inventories and distribution costs. Second, cross-side network effects are strong for both sides of the network. Most consumers value access to a wide variety of titles, and studios realize scale economies when they can sell to more consumers. Third, opportunities for technical differentiation are modest, because DVD players connect to TV sets, which are standardized in ways that intrinsically limit DVD picture and sound quality.

For these reasons, the DVD market was bound to be served by a single platform. Potential platform providers anticipated this outcome and faced a choice: They could fight for proprietary control of the platform or pool their technologies. Industry participants chose the latter approach, jointly creating the DVD format in 1995 and avoiding a replay of the VHS-Betamax standards battle.

Why share a network when proprietary control promises monopoly profits once rivals are vanquished? The answer seems clear enough if senior managers believe that their company's platform is not likely to prevail. However, even those firms that have a fighting chance of gaining proprietary control stand to realize benefits from sharing. First, the total market size will be greater with a shared platform. During a battle for dominance in a two-sided network, some users will delay adoption, fearing that they will be stranded with obsolete investments —like a Betamax VCR—if they back the loser. Second, since the stakes are so high in battles for network dominance, firms spend enormous amounts on upfront marketing. Rivalry tends to be less intense with a shared platform, reducing marketing outlays.

Winning the battle. To fight successfully, you will need, at a minimum, cost or differentiation advantages. Three other assets are important in establishing proprietary control: First, platform providers gain an edge when they have preexisting relationships with prospective users —often in related businesses. Adobe, for example, leveraged its user base for PostScript printing products when launching PDF. Second, high expectations generate momentum in platform wars, so a reputation for past prowess helps a great deal. Having vanquished rival PC operating systems, Microsoft is feared and respected as a ruthless and competent rival. Third, in a war of attrition, deep pockets matter. Again, just ask Microsoft!

First-mover advantages can also be significant in platform battles, but they are not always decisive. In fact, when the market evolves slowly, late mover advantages may be more salient. Late movers may, for example, avoid the pioneer's positioning errors, be better placed to incorporate the latest technology into product designs, or be able to reverse engineer pioneers' products and beat them on cost. Google, which lagged Web-search pioneers by several years, avoided portals'

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clutter in favor of a simple, fast-loading home page. It also copied and then improved on Overture's paid-listing model for generating revenue from searches.

In a battle for platform control, first and late movers alike will feel strong pressure to amass users as quickly as possible. In most cases, this urgency is appropriate. Positive word-of-mouth favors the early mover. But racing to acquire users can be a mistake under two circumstances. First, executives must ask whether their business is readily scalable. For example, platforms that must support complex customer-service interactions—like stop-loss orders or margin trades at an online brokerage firm—typically require skilled professionals. The need to recruit and train such personnel can put the brakes on rapid growth. Second, due to their explosive growth potential, platform-mediated networks are prone to boom or bust valuation cycles. When they launch cash-draining "get big fast" strategies, therefore, top managers need to be sure that funding will be forthcoming should capital-market sentiment turn negative.

Challenge 3: The Threat of Envelopment

You can do a great job addressing pricing and winner-take-all challenges and establish a successful new platform yet still face great danger. Why? Your platform may be "enveloped" by an adjacent platform provider that enters your market. Platforms frequently have overlapping user bases. Leveraging these shared relationships can make it easy and attractive for one platform provider to swallow the network of another. The real damage comes when your new rival offers your platform's functionality as part of a multiplatform bundle. Such bundling hurts the stand-alone platform provider when its money side perceives that a rival's bundle delivers more functionality at a lower total price. The stand-alone platform provider cannot respond to this value proposition

because it cannot afford to cut the price on its money side and it cannot assemble a comparable bundle.

Networked markets—especially those in which technology is evolving rapidly—are rich with envelopment opportunities that can blur market boundaries. This blurring is called "convergence." For example, mobile phones now incorporate the functionality of music and video players, PCs, and even credit cards. Likewise, eBay—having acquired PayPal and the voice-over-Internet protocol (VoIP) start-up Skype, as well as equity in Craigslist—is on a collision course with Google, which also offers a payment service (Google Checkout), VoIP (Google Talk), and a listing service (Google Base).

In many cases, a stand-alone business facing envelopment has little choice but to sell out to the attacker or exit the field. Some, however, manage to survive. RealNetworks, the pioneer of streaming media software, is—at least so far—a case in point.

Real's original business model was ideally suited to the needs of its two-sided network: Consumers downloaded its streaming media player for free, and content companies paid for its server software. As a result, the company quickly dominated the new market and earned modest profits in 1999 and 2000. But as early as 1998, Real's streaming media franchise was under attack from Microsoft. Like Real, Microsoft freely supplied its Windows Media Player (WMP) to consumers. But Microsoft also bundled its streaming software at no additional cost as a standard feature of its NT Server—a multipurpose operating system that also incorporated file, print, email, and Web servers, among other functions.

Since content companies—Real's money side—needed a multipurpose server anyway, they could buy NT and receive a "free" streaming media server. As content companies embraced this attractive proposition,

consumers switched with them, because Microsoft's streaming media servers worked only with its own media players, and vice versa. By 2003, 42% of Internet users in North America identified WMP as their primary media player, compared with 19% for Real's player.

Microsoft has not been the only threat. Real's Rhapsody subscription music service is now threatened with envelopment by Yahoo and ultimately by Apple. In 2005, Yahoo introduced a subscription music service—including downloads to portable music players—for $5 per month. Yahoo could afford to price aggressively, because bundling subscription music into its portal would increase user retention rates and, through cross-marketing, boost revenue from its other services. Likewise, Apple might choose to offer a subscription version of iTunes, drawing on the very lucrative iPod—its money side—to subsidize an envelopment attack. Real cannot match it rivals' bundles because it does not own a portal or sell an MP3 player.

But Real is not without options. Its defense against Microsoft and, more recently, Yahoo and Apple shows what a focused firm can do to survive envelopment.

Change business models. Real's response to Microsoft's envelopment attack was to switch its money side. Ceding the streaming media business, Real leveraged existing relationships with consumers and music companies to launch Rhapsody in 2003, charging $10 per month for unlimited streaming to any PC from a library of a half-million songs. Real now profited from consumers, rather than subsidizing them. Another common way for specialists like Real to reinvigorate their business models is to offer services as a systems integrator—helping enterprises knit together diverse systems and technologies. Indeed, Real was doing precisely that for a number of big music companies even before it launched Rhapsody. And it's no accident that IBM—the

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dominant provider of computing platforms through the mid-1980s—has more recently focused on systems integration. Facilitating transactions across a two-sided network requires platform providers to coordinate users' activities. Hence, managing a platform builds system integration skills that can be exploited.

Find a "bigger brother." When bullied on the playground, a little guy needs a big friend. Real has found allies through partnerships with cable TV system operators and cellular phone companies. Subscription music —which requires a broadband connection—makes cable modem service stickier: Once consumers commit to a music service, they face switching costs. Changing vendors would force them to configure new music players and recreate playlists. Real also bundles its Rhapsody Internet radio product with Sprint's wireless phone service and streaming video with Cingular's service. Cellular phone companies are attractive allies for Real, because they can mount their own envelopment attacks if Apple ever enters the subscription music market. Cellular carriers can afford to subsidize digital music playback on their phones, since doing so would be likely to reduce cell phone churn rates. That would present a big threat to Apple's money side.

Sue. Firms facing envelopment are wise to consider legal remedies, because antitrust law for two-sided networks is still in dispute. Antitrust law was conceived to constrain the behavior of traditional manufacturing firms and does not fully reflect the economic imperatives of platform-mediated networks. For this reason, dominant platform providers that offer bundles or pursue penetration pricing run the risk of being charged with illegal tying or predation. Exploiting this opportunity, Real brought Microsoft to antitrust court and then in 2005 received a $760 million payment from Microsoft to end the lawsuit. Sun Microsystems and Time Warner—Netscape's current owner—reaped

similar bounties after they challenged Microsoft's anticompetitive behavior in court.

The threat of envelopment means that vigilance is crucial for a focused platform provider. Formulating strategy for platform-mediated networks is like playing three-dimensional chess: When market boundaries blur, envelopment attacks can come from any direction. However, focused firms are not without advantages when competing with large, diversified companies. Big firms can be slow to recognize envelopment opportunities and even slower to mobilize resources to exploit them. Also, envelopment requires cross-business-unit cooperation, a significant barrier in many diversified companies. Sony, for example, has struggled to coordinate strategy across its consumer electronics, video game, movie, and music businesses. Once the industry's trailblazer with products like the Walkman, Sony has seen Apple usurp this role. Mistakes like this on the part of established companies are precisely why former upstarts like Google, eBay, and Yahoo have grown into giants.

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Despite the ubiquity of network industries and the attractions of owning a successful platform, the strategic implications of two-sided networks have gone largely unexplored. In the past, this lack of understanding was less problematic because executives usually had the luxury of formulating strategies for two-sided networks through trial and error. Markets today are less forgiving. Many opportunities for platform creation arise in high-tech sectors with short product life cycles. Opportunities also abound in traditional industries reconceived as two-sided networks. And, thanks to the Internet, firms have easy access to both sides of new markets. In this environment, if you draw attention to a platform opportunity and don't get it right the first time, someone else

will. Thinking carefully through the strategic issues we've outlined here will give you a head start.

1. See Geoffrey Parker and Marshall W. Van Alstyne, "Two-Sided Networks: A Theory of Information Product Design," *Management Science* (2005) and Jean-Charles Rochet and Jean Tirole, "Platform Competition in Two-Sided Markets," *Journal of the European Economic Association* (2003).

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