

Multi-Sided Platforms

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Abstract

The economics of two-sided markets or multi-sided platforms has emerged over the past decade as one of the most active areas of research in economics and strategy. The literature has constantly struggled, however, with a lack of agreement on a proper definition: for instance, some existing definitions imply that retail firms such as grocers, supermarkets and department stores are multi-sided platforms (MSPs). We propose a definition which provides a more precise notion of MSPs by requiring that they enable *direct* interactions between the multiple customer types which are *affiliated* to them. Several important implications of this new definition are derived. First, cross-group network effects are neither necessary nor sufficient for an organization to be a MSP. Second, our definition emphasizes the difference between MSPs and alternative forms of intermediation such as “re-sellers” which take control over the interactions between the various sides, or input suppliers which have only one customer group affiliated as opposed to multiple. We discuss a number of examples that illustrate the insights that can be derived by applying our definition. Third, we point to the economic considerations that determine where firms choose to position themselves on the continuum between MSPs and re-sellers, or MSPs and input suppliers.

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1. Introduction

Research in two-sided markets studies how payment networks bring together cardholders and retailers, shopping malls bring together shoppers and retailers, and video game systems bring together gamers and game developers. Indeed, the economics of two-sided markets (also sometimes referred to as multi-sided platforms) has emerged over the past decade as one of the most active areas of research in economics and strategy. It has also drawn considerable interest from practitioners. This is for two main reasons. First, this literature covers a vast array of different industries throughout the economy. Multi-sided platforms are particularly prevalent in IT industries and are playing an increasingly important role in the global economy (e.g. Alibaba, Amazon, eBay, Google). Second, the literature has raised several novel policy and strategy questions. A recent survey by Rysman (2009) explains more fully the reasons for the interest, and some of the tricky policy issues that arise.

Despite the widespread interest, one issue that the literature has constantly struggled with is the lack of agreement on a proper definition of a two-sided market or a multi-sided platform. In the absence of an agreed definition, it is still not quite clear what makes these multi-sided platforms special relative to other intermediaries or organizations. Indeed, this is the most common question posed by economists and other scholars not working in the area, who often go on to add, "*after all, isn't every market two-sided?*"

In this paper, we propose a new definition of multi-sided platforms (MSPs) that aims to capture what makes eBay, shopping malls, Yellow Pages directories and dating websites different from regular firms (e.g. a bakery, a hotel, or a car dealership), as well as how to characterize less clear-cut examples such as department stores, movie theatres, video game arcades, cable TV or satellite radio companies, consulting firms, Skype or YouTube. Specifically, we define a MSP to be an organization that creates value *primarily* by *enabling direct* interactions between two (or more) distinct *types of affiliated* customers. Each of the italicized terms is a potential point of difference with existing definitions. We will explain

exactly what each means and why they are important to properly defining MSPs, illustrating with examples.⁴

There are several important implications of our definition. First, in our view cross-group network effects or indirect network effects are neither necessary nor sufficient for an organization to be a MSP – contrary to most existing definitions. This relates to the fact, as will be explained in Section 2, that existing definitions based on network effects are both under-inclusive and over-inclusive. Indeed, many authors insist on the presence of indirect network effects in their definition of MSPs. Doing so contradicts their treatment of advertising supported media as a canonical example of a MSP given that they also typically recognize that people do not value advertisements in making their subscription decision (so that indirect network effects may not arise for these platforms).

Second, our definition suggests that the focus on price structure across the multiple sides may not be the only (or even the main) point of difference when comparing MSPs with other organizational forms. Rather, the economics of MSPs as analysed from the vantage point we propose emphasizes their role as an alternative form of intermediation that *directly* brings together different *affiliated* customers rather than acting as a middle-man standing between them, which we call a re-seller. By requiring that MSPs enable direct interactions, we are able to clarify what distinguishes MSPs from re-sellers (e.g. grocery stores, retailers). By requiring that multiple customer types be affiliated, we are able to clarify what distinguish MSPs from input suppliers.

For both cases, we believe that the distinction usually involves a continuum rather than a bright line. Furthermore, the position along the relevant continuum – closer or further from a “pure” MSP – is often the result of organizations’ strategic decisions. Thus, the third contribution of our paper is to discuss the economic trade-offs that determine where organizations choose to place themselves on the continuum between MSPs and re-sellers, or between MSPs and input suppliers.

⁴ We prefer the terminology “multi-sided platforms” (MSPs) rather than “two-sided markets” for a number of reasons. First, in almost all of the existing definitions we have encountered, the authors refer to the two-sided market businesses as “platforms”. Second, the focus on only two sides is obviously unnecessarily restrictive. Third, the markets in which MSPs compete might be referred to as two-sided or multi-sided markets. It is however noteworthy that the matching literature (starting with Shapley and Shubik, 1971) has used the term in a somewhat different context.

Although our approach implies cross-group network effects are not the key factor which determines the extent to which an organization is a MSP, we nevertheless recognize that they are important in many classic examples of MSPs. Thus, even if one accepts our notion of MSPs, it is still useful in many cases to distinguish MSPs that face significant cross-group network effects from those that do not. Those that do may be referred to as MSPs with network effects (or multi-sided networks). In making this additional distinction we do not intend to discount in any way the substantial contributions of previous authors who have analysed the implications of cross-group network effects for pricing strategies and economic policy (e.g. Caillaud and Jullien (2003), Rochet and Tirole (2003), Parker and Van Alstyne (2005), Armstrong (2006), Rochet and Tirole (2006), Rysman (2009), Weyl (2010)). Indeed, our own contributions to this burgeoning literature have largely been focused on the same issues. It is, however, important to note that our definition of MSPs may not accommodate some intermediaries that exhibit cross-group network effects (e.g. cable TV systems, movie theatres, or iTunes).⁵ More fundamentally, we believe our approach is needed given that the extent to which organizations enable direct interactions between customers is a key strategic issue that distinguishes regular retailers and professional firms from MSPs, yet it has received little attention in the literature to date. Finally, note that we focus specifically on MSPs and not platforms in general. The latter have received significant attention in the strategy and management literature, where they are usually defined as essential products, services or technologies upon which other products or services can be built (e.g. Gawer and Cusumano (2008), Iansiti and Levien (2004)). Many platforms are not MSPs.

Before turning to our definition, in the next section we review some existing definitions, explaining the controversies that currently exist. We proceed to formulate our definition and discuss some of its implications and the subtler issues it raises in section 3. Section 4 shows why significant cross-group network effects or indirect network effects are neither necessary nor sufficient for an organization to be considered a MSP. Section 5 discusses a series of potentially problematic examples meant to illustrate the clarifying power of our definition. In the last two sections we analyse some of the economic and strategic trade-offs arising when organizations can choose between acting as a MSP vs. a re-seller (section 6) or as a MSP vs. an input supplier (section 7). We conclude in section 8.

⁵ Such intermediaries face some form of the “chicken-and-egg” problem in attracting their multiple sides, so that the “classic” multi-sided pricing structure analysis is still quite relevant in analysing them (Eisenmann, Parker and Van Alstyne (2006)).

2. Existing definitions of MSPs and disagreements

Existing definitions of two-sided markets suffer from excessive specificity, over-inclusiveness, or too much vagueness to be of use. As a result there is disagreement among contributors to the literature about what is the appropriate definition.

Most existing definitions of two-sided markets focus on the presence of important cross-group or indirect network effects⁶ between the two or more customer groups participating on the platform. Caillaud and Jullien (2003) require the presence of some indirect network externality across distinct groups of intermediaries' customers. Rochet and Tirole (2003, p. 990) note that "*many if not most markets with network externalities are characterized by the presence of two distinct sides whose ultimate benefit stems from interacting through a common platform.*" Parker and Van Alstyne (2005, p. 1494) model what they call a "*two-sided network externality.*" Armstrong (2006, p. 668) defines two-sided markets as markets involving "*two groups of agents who interact via 'platforms,' where one group's benefit from joining a platform depends on the size of the other group that joins the platform.*" Evans and Schmalensee (2007, p. 151) characterize two-sided platforms as businesses in which "*pricing and other strategies are strongly affected by the indirect network effects between the two sides of the platform.*" In their New Palgrave dictionary entry, Armstrong and Wright (2008) define two-sided markets as situations where "*platforms enable interactions between two distinct groups of users, each of whom cares about the attributes of users of the other type on the same platform*" which they go on to characterize as cross-group network effects. Hagiu (2009) explicitly defines two-sided platforms connecting consumers and third-party producers by requiring that both sides "*gain access to the same platform in order to be able to interact and the value of platform access to each side is higher, the more members are present on the other side.*" Rysman (2009, p.127) writes "*Indeed, in a technical sense, the literature on two-sided markets could be seen as a subset of the literature on network effects.*" Choi (2010, p. 608) writes "*The defining characteristics of two-sided markets are indirect network effects or inter-group network*

⁶ A *cross-group network effect* arises if the benefit to users in *at least* one group (side A) depends on the number of users in the other group (side B) that join. An *indirect network effect* arises if there are cross-group network effects in *both* directions (from A to B and from B to A) and side B's participation decision depends on the number of participants on side A so that the benefit to a user in side A depends (indirectly) on the number of users on side A. Some definitions require the existence of cross-group network effects in one direction, while other definitions require indirect network effects (i.e. cross-group network effects in both directions) arise.

externalities that arise through improved opportunities to trade with the other side of the market."

According to these definitions either cross-group network effects are required in at least one direction, or they are required in both directions so that indirect network effects might arise. In the former case the definitions suffer from *over-inclusiveness*. Requiring only cross-group network effects in one direction, MSPs would include any retailer for which consumers value the number and variety of suppliers' products carried by the retailer and any professional firm for which clients value the number and variety of professionals employed. Given these effects are likely to be important for most customers in choosing between retailers or professional firms, relying on the significance of the effects to distinguish MSPs from regular firms is also unlikely to be helpful. Indeed, any firm offering a product for which the value to one group of customers increases with the demand of another would be a candidate for a MSP by such a definition (e.g. a firm offering a branded product and marketing it to trend-setters in order to raise demand by followers).

In the latter case, in which cross-group network effects are required in both directions, the definitions suffer from *under-inclusiveness*. Whenever one side's decision to participate does not depend on the number of users on the other side, then indirect network effects will not arise, meaning a newspaper (or other advertising supported media) for which readers do not care about the number of advertisements cannot be used as an example of a MSP. At the same time, such a definition would also suffer from *over-inclusiveness* given that a retailer that pays suppliers based on the number of sales it makes (so suppliers care how many shoppers the retailer attracts) or a professional firm that pays its professionals based on the number of clients they serve (so professionals care how many clients the firm attracts) would also face cross-group network effects in both directions, but yet in our view this factor would not make such organizations MSPs.

Rochet and Tirole (2006) also point out that cross-group externalities are endogenous; they depend on the platform's pricing policy. For example, a payment card or media platform that charges fees on one side that are purely per interaction might insulate users' participation decisions on one side from the number of users on the other side, thereby eliminating an indirect network effect. But the lack of an indirect network effect due to a switch to per-interaction charges from membership fees should not change whether we call such a business two-sided, a

point argued by Rochet and Tirole (2006) and Weyl (2010). This provides a further reason why definitions of MSPs based on indirect-network effects can be *under-inclusive*.

In an alternative to definitions based on cross-group network effects and indirect network effects, Rochet and Tirole (2006) propose a very precise definition of two-sided markets. They consider a platform charging per-interaction charges to the two sides. They call a market for interactions between the two sides to be two-sided if the volume of transactions realized on the platform depends on the structure of the per-interaction charges across the two sides (holding constant the total level of per-interaction charges). With two-part tariffs, Rochet and Tirole say that a market is two-sided if either the split of marginal prices is non-neutral, or, if it is neutral, the structure of fixed fees matters.⁷

But this definition also arguably suffers from a form of over-inclusiveness, as has been pointed out by some others in the literature, such as Rysman (2009, p.127). For example, the structure of fees set by a typical retailer to its consumers and prices paid to its suppliers will matter in realistic settings. Moreover, even if the fee structure is neutral in the sense of Rochet and Tirole (e.g. suppose retailers perfectly surcharge the use of AMEX cards in a way to make the structure of AMEX's pricing neutral), this should not change the fact that AMEX's underlying business would still involve enabling cardholders and retailers to transact directly using its cards, the feature we think really makes AMEX a MSP. Rather, we view the Rochet and Tirole (2006) definition of two-sidedness as a useful test of whether price structure matters in MSPs, a critical policy issue for the payment cards industry. In contrast, in this paper, our goal is to determine the essential economic features of "two-sided businesses," which we call, in general, "multi-sided platforms".

3. Defining multi-sided platforms

In this section we provide our definition of a multi-sided platform (MSP) and explain each of the terms in the definition in depth.

Multi-sided platform (MSP): *an organization that creates value primarily by enabling direct interactions between two (or more) distinct types of affiliated customers.*

⁷ Presumably one can extend their idea to other richer tariffs, or in case platforms also compete in other dimensions than prices, although this has not been done.

As we will discuss in the following sections, MSPs include such organizations as American Express, eBay, Facebook, iPhone, Mall of America, Match.com, Skype, Sony PlayStation, Vogue magazine, Yellow Pages, and YouTube, in their current forms, but do not include traditional cable TV companies, department stores, movie theatres, satellite radio companies, or video game arcades. Some of the terms employed in our definition require further discussion, since they are key to arriving at a precise notion of MSPs and they give rise to some subtle issues.

Organization

We use the term “organization” in order to make it clear that the notion of MSP is not restricted to regular businesses, but also encompasses groups of firms, not-for-profit organizations or even cities that create a valuable interaction service (e.g. credit card networks, the Blu-ray consortium, Multiple Listing Services, collections of Internet Providers, Hong Kong/Singapore). It is also possible that only a part of an organization (e.g. division of a firm) acts as a MSP while the rest of the organization does not – in that case, the proper unit of analysis is that specific part of the organization. For convenience of exposition we will henceforth use the short hand “organization” to cover all of these possibilities.

Primary source of value

In a MSP, enabling direct interactions is the primary way in which the platform creates value. This means that the primary source of value created by the platform must be the customer’s ability to *directly interact* with one or more of the other types of customers. For some organizations, direct interactions could be present between different types of users but they are not significant enough for users in their affiliation decisions to label the organizations as MSPs. For example, bowling alleys and sports bars do enable some flirting between men and women, but that is not their primary source of value (unlike dating clubs).

For this reason we think of “pure MSPs” as being one extreme of a continuum: the other extreme would be organizations that do not create any value by enabling direct interactions between distinct types of affiliated customers. These could be traditional firms that sell their own product or service direct to consumers, firms that buy products or services from third-party providers and re-sell them under their own name (we call these “re-sellers”), as well as other alternative types of organizations which we will discuss. Some organizations are closer to the

pure MSP, others are further away, and the same organization can move along the continuum. For example, Playboy magazine does allow some advertisers to reach potential consumers but this is not likely to be as important as it is for Vogue magazine, the contents of which is more heavily skewed towards advertising. Thus, Playboy and Vogue lie at different points on the continuum.⁸

Our definition clarifies the dimension along which this continuum is defined (namely, the significance of the value created by the organization in enabling direct interactions between distinct types of affiliated customers). Where the value created in this way is clearly not the primary value for the organization concerned, we do not think it is appropriate to label it as a MSP. Thus, for example, if the value lost by taking away the direct interactions enabled by the organization is relatively trivial compared to the value lost by taking away any other goods or services offered for sale by the organization, the organization should not be called a MSP in our view. In many cases, organizations will belong along the continuum between the two extremes, and in such cases whether they are labelled as MSPs or not is less important in our view than understanding what determines where they belong on the continuum.

Direct interactions

Interactions involve joint activities between distinct customer types – broadly speaking, combinations of communication, exchange and consumption between them. *Direct* interactions between customer types A and B of an organization P involve such interactions in which A and/or B retain control rights over the key terms of the activity. Usually the meaning of direct interactions is clear. One case that requires clarification is when A and B are linked by contracts, either directly, through P or through one or several other intermediaries. For these scenarios the meaning of direct is that the contracts linking A and B are not controlled by P (e.g. buyers and sellers on eBay or at a shopping mall, game developers and end-users on a videogame console).

Examples of consumption activities enabled by some technology or infrastructure, in which A consumes B's good or service include playing a game on a videogame console system, using an application on an iPhone, and getting a massage at a spa located in a shopping mall. Examples of exchange activities, which involve any exchange of goods, services or assets

⁸ A three-month sample of Playboy magazine (April-June 2011) had 22.1% advertisements (98 out of 444 total pages), while a sample of Vogue during the same time period had 57.4% advertisements (472.99 out of 824 total pages). Data obtained from Baker Library Research.

between A and B, include cases in which exchange is enabled by the facilitation of physical or virtual distribution (e.g. downloading third-party applications in Apple's App Store), price discovery through negotiation or other mechanisms (e.g. eBay's auctions) and/or settlement of transactions (e.g. eBay's PayPal and AMEX payment services). Examples of communication, which is to be interpreted quite generally, include one-way communication (e.g., a Vogue reader *seeing* an ad in the magazine,⁹ consumers using eBay's product search feature to browse offerings posted by various sellers), as well as two-way communication (e.g., men and women using the instant messaging service within Match.com or chatting at a nightclub, or paid keynote speakers at a business conference and the audience networking over cocktails) and social interactions between people (e.g. individuals flirting and possibly also physically interacting at a nightclub). Our classification of interactions into communication, exchange and consumption is not meant to be mutually exclusive or collectively exhaustive. For example, it is sometimes difficult to distinguish consumption from communication as the service consumed by one side could be interpreted as communication by the other side (e.g. a user watching another user's video on YouTube or a reader reading a writer's book self-published through Amazon's Kindle Digital Text Platform).

Our definition of direct interactions implies that whenever A consumes goods or services of B which are supplied through P such that P takes over the contractual relationship linking A and B, then the associated consumption and exchange will not be a direct interaction between A and B since A is effectively consuming goods and services controlled by P. An illustration of this scenario is provided by cable TV systems. A cable company takes control over the exchange between channels and consumers by acquiring the rights to sell the content to consumers in bundles that it designs and at prices of its choosing. Therefore, the fact that consumers watch the channels through the cable company's network and set-top box is no longer a direct interaction between consumers and channel providers.¹⁰ Another illustration is videogame arcades. Even though arcades enable consumption of games, they typically take control over the sale of the game experience to users, so they do not enable direct interactions. A

⁹ A key feature of any interaction is that value is only created when there are two (or more) parties involved. This is also true for one-way communication such as advertising. Thus, the ad must be seen by the reader in order for it to count as an interaction. This implies that not all ads placed in a magazine or a newspaper create interactions with all readers and that an interaction is not created merely by the fact that an advertiser places an ad and someone subscribes to the magazine or newspaper.

¹⁰ An exception is the few channels (e.g. HBO) that maintain the rights to sell directly to consumers on top and independently of the cable bundle.

further illustration is hair salons (or other firms whose services to customers are provided by their employees). Although hair dressers may have significant freedom in how the service (the haircut) is actually provided to or consumed by customers, when hair dressers are employed by the hair salon to provide the service to its customers, it is the hair salon that controls the commercial relationship (i.e. is liable for service provision to customers) and so the interaction is not direct.

Our definition also implies that if A consumes goods or services of B that are supplied through some independent re-seller R (i.e. other than P) and P does not take over the contractual relationships between B and R and between R and A, then this is a direct (consumption) interaction.¹¹ An example is provided by videogame consoles. Most console games continue to be acquired by users through third-party retailers, either offline (e.g. GameStop) or online (Amazon): the corresponding consumption interactions are therefore direct. Note however that the current generation of consoles is the first in the industry's history to feature online stores for distributing games (Sony's PlayStation Store, Nintendo's Wii Shop Channel and Microsoft's Xbox Live Marketplace), which are starting to take market share away from independent retailers. Suppose for the sake of argument that Sony decided to make the PlayStation Store the only distribution channel for PlayStation games. In this scenario, since the purchase contracts on the PlayStation Store are solely between users and Sony,¹² Sony's PlayStation division would cease to be a MSP according to our definition since it would no longer enable any direct interactions. Third-party game developers would become upstream suppliers. This would remain true even if third-party game developers continued to determine the sale price of their games in the PlayStation store, something that would amount to resale price maintenance.

Requiring MSPs to enable *direct* interactions is crucial in ruling out a broad category of intermediaries that buy goods or services from suppliers and sell them to buyers (i.e. "re-sellers"). Immediate examples are grocery stores, convenience stores and supermarkets. Consider retailers in general: the exchanges (purchase contracts) are between buyers and the retailer, and between the retailer and their product suppliers, not between buyers and product

¹¹ The same would be true for any chain of multiple re-sellers between A and B.

¹² When a user buys digital content (movies or games) in the PlayStation Store, the contract is explicitly between the user and Sony Network Entertainment International LLC (SNEI). PlayStation Terms of Service and User Agreement (September 15, 2011) http://legaldoc.dl.playstation.net/ps3-eula/psn/u/u_tosua_en.html.

suppliers directly.¹³ And while consumers will often obtain some exposure to the manufacturers' products through the retailer without necessarily purchasing those products, this “communication” (advertising) function is not usually the primary value created by the retailer. Thus, in their standard form, such intermediaries are not MSPs in our view.

We will return to discussing more subtle examples, such as department stores in which suppliers have their own staff demonstrating products, and shelf space sold by supermarkets to suppliers, in section 4.

Enabling

The relevant direct interactions for a given organization are only those that it specifically *enables*, i.e. which happen *on* or *through* it. Yellow Pages enables a direct interaction between potential buyers (readers) and sellers (advertisers), but that interaction is limited to the information provided by advertisers to readers in their ads listed in Yellow Pages (communication). It does not involve any subsequent exchange (transactions) that may arise between the two parties as a consequence of the information in the Yellow Pages ad (those transactions could well be enabled by a different MSP, such as a shopping mall). Similarly, the direct interactions between men and women enabled by Match.com are solely those that happen on the site: the matching through profile browsing, and any messaging using Match tools. As soon as the man and woman interact outside of Match.com however, according to our definition they are engaging in direct interactions that are beyond those enabled by Match (although they are a *consequence* of the interaction on Match.com¹⁴). These other interactions may well be enabled by other MSPs, e.g. a bar, a nightclub or a romantic restaurant that caters to couples. Finally, the warranty contracts offered to consumers by, say, manufacturers of HD television sets sold at BestBuy do not make BestBuy a MSP since they are not enabled by it.

Most often, whenever A consumes a good or service supplied by B, this is preceded by exchange and/or communication between A and B. In some cases communication, exchange

¹³ When a consumer C buys a product manufactured by supplier S from retailer R, C enters into a contract with the R and it is implied by the sale that the product will conform to basic standards. If the product turns out to be immediately deficient, C can hold R liable, and it is R's responsibility to remedy (by making a claim to S under the sourcing contract they have with one another). For example, this responsibility is governed by the Uniform Commercial Code in the United States (U.C.C. §2-314 (2001), <http://www.law.cornell.edu/ucc/ucc.table.html>) and by the 1979 Sale of Goods Act 14(2) in the United Kingdom (<http://www.legislation.gov.uk/ukpga/1979/54>).

¹⁴ Thus, we do not dispute Match.com's and other online dating sites' advertising claims of being responsible for (an increasing number of) marriages.

and consumption are enabled by the same MSP (e.g. Apple's iPad enabling a user to browse and search third-party apps through the App Store, purchase them using the user's account in Apple's billing system and use them directly on the iPad). In other cases a given MSP only enables communication and exchange (e.g. eBay) and yet in others a given MSP only enables the consumption (e.g. the Windows operating system for personal computers¹⁵).

Affiliation

We say that a customer is “affiliated” with a platform if (s)he has made a *conscious decision* to participate that is specific to the platform and that is *strictly necessary* in order to be able to directly interact with the other customer types on the platform. The decision to participate oftentimes (but not always) involves some fixed investment, which could be made directly or through a re-seller of the platform's services (e.g. the retailer selling a video game system's consoles). The following are the most common examples of platform-specific investments that customers have to make:

- Incurring an opportunity cost in terms of time or inconvenience: e.g. intentionally traveling to go to a particular shopping mall, going to a website (and figuring out how to use it and registering), learning how to use a new computer system, putting up a profile on a social network, or signing up to get a new payment card.
- Paying an access fee: e.g. buying a video game console or purchasing membership to a dating website.

Sometimes, affiliation is costless or even carries rewards. For instance, credit card companies routinely offer sign up bonuses for customers.

The requirement that customer types be conscious of their affiliation decision is meant to rule out unreasonable cases in which the MSP in question is located in the same place (physical or virtual) as some other entity that has no connection to the MSP's activities and with which customers of the MSP do not consciously affiliate. Such an entity does not become a MSP when customers “travel” to it in the process of affiliating with the MSP. For instance, retailers located in a shopping mall and a consumer going to the mall affiliate with the mall owner, not with the

¹⁵ As of this writing, Microsoft still has not set up an online marketplace for Windows PC applications although it is rumoured to do so sometimes in the near future.

owner of the land underneath. Similarly, participants of a speed-dating event affiliate with the organizer of the event, not with the owner of the building in which it is held.¹⁶

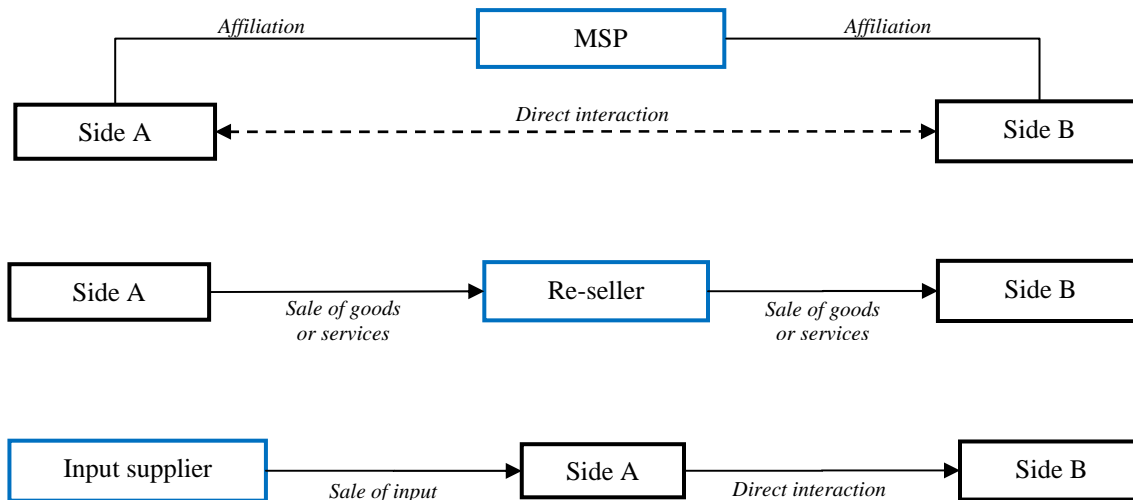
The requirement that *all* relevant customer types be affiliated with the MSP is also meant to rule out products or services that enable direct interactions but only need to be adopted by one type of customer. For example, the electronic ink technology produced by Cambridge-based E-Ink is the key building block on which the major e-book readers (Amazon's Kindle, Sony's Reader, Barnes & Noble's Nook) are built. E-Ink clearly enables direct interactions (i.e. e-book distribution and reading) between consumers, book publishers and device manufacturers (Sony, Amazon, Barnes & Noble). Yet E-Ink is *not* a MSP because only the device manufacturers are affiliated with it: each of them includes E-Ink technology in its devices, transforms books in e-books and offers a digital book store where consumers can purchase and download books in the corresponding e-reader format. Consumers and book publishers never have to deal with E-Ink (either directly or through a re-seller). Instead, E-Ink is simply an input supplier.

Another example of a non-MSP input supplier is Brightcove, an online video platform that enables media companies (e.g. Discovery Channel, Fox, Sony Music) to create and post high-quality videos on their websites, to be watched by users. The latter do not need to install or subscribe to Brightcove: as long as they have an up-to-date browser equipped with Flash technology, they can automatically play Brightcove-powered online videos from any website. Content providers control all important aspects of the video – how to display, whether to charge for it or provide advertising, etc. Thus, although Brightcove enables direct interactions between online content providers and users, there is no meaningful sense in which users are affiliated with the Brightcove platform.

Figure 1 below is designed to represent in a simple way the key distinctions between MSPs and input suppliers on the one hand and between MSPs and re-sellers on the other hand.

¹⁶ A landowner could become a MSP if it provides some kind of coordinating device which attracts customers to consciously travel to its location in order to directly interact (e.g. to trade). This is basically what a flea market does when it puts up signage and promotes the venue, although typically more organization is involved (allocation and coordination of spaces for vendors, tables, parking, power and lighting, arranging entertainment, restrooms, security, as well as the collection of fees from one or both sides).

Figure 1: Differences between input suppliers, MSPs and re-sellers



Similarly, our requirement rules out billboard advertising on the side of buildings. The side of a building used for billboard advertising may attract eye-balls of people passing by and therefore advertisers. In our view, this does not make the building (or its owner) a MSP since people who see the billboard advertisement as they pass by do not consciously affiliate with the building in any meaningful sense.

Customer types

By “distinct types of customers” we mean customer types that can be distinguished by the platform *at the point they interact*. This is in contrast with the notion of fixed “customer groups” adopted by most (if not all) previous authors,¹⁷ which implies the distinction is to be made at the point customers make their affiliation decisions with the platform.

There are two main reasons for why we distinguish customer types at the time of interactions. First, for some platforms, the distinction between different customer *groups* at the moment of affiliation is problematic. As an example, consider a website like YouTube, which enables direct interactions (communication and/or consumption) between users who post videos and users who watch them. Abstracting away from advertisers, how many customer groups does

¹⁷ All formal models of two-sided markets (e.g., Armstrong 2006, Caillaud and Jullien 2003, Rochet and Tirole 2006, and Weyl 2010) assume the two different groups of customers are exogenously given, so the distinction between the groups applies equally to both affiliation and usage. Indeed, in the general framework put forward by Weyl, users do not make any endogenous usage decisions as their interactions are determined exogenously given their affiliation decisions.

YouTube have at the moment of affiliation? Some users are distinctively more inclined to post, while others are mainly viewers, but most users however both post and view (in various proportions). It would be impractical from YouTube's perspective and meaningless from our perspective to try to distinguish between two or more customer groups at the moment of affiliation. Instead, the demarcation between poster and viewer is clear at the moment a given video is viewed (i.e. the point of interaction). The same issue occurs for e-commerce platforms (e.g. eBay), where many users are sometimes buyers and sometimes sellers, and for communication networks (e.g. a telephone network or Skype), where customers are sometimes callers and sometimes receivers. Second, our intention is to shift the focus away from the number of sides of any given MSP (this was important in the earlier literature on two-sided markets, which focused on cross-group network externalities and the possibility to price discriminate between different customer groups) and towards the interaction-enabling aspect of these platforms. Furthermore, platforms sometimes price-discriminate between different users based on the role they play in any particular interaction (e.g., in many countries, outgoing phone calls are priced whereas incoming calls are not).

A further implication of our distinction of customer types at the level of direct interactions is that we can define one-sided platforms in the same way as MSPs, with the exception that the customers are all of the same type when they interact from the perspective of the MSP. A reasonably clear example would be a dating agency specializing in matching gay customers or a gay nightclub.

4. Multi-sided platforms and cross-group network effects

A key implication of our definition is that the existence of cross-group network effects (or indirect network effects) is neither necessary nor sufficient for a firm to qualify as a MSP.

Cross-group network effects are not sufficient for MSPs

We start by providing examples of intermediaries that exhibit cross-group network effects but are not MSPs.

Consider first traditional retailers such as Wal-Mart, convenience stores, supermarkets, etc. As mentioned in section 2, such retailers would satisfy most existing definitions of two-

sided markets based on cross-group network effects in at least one direction: shoppers value the number and variety of suppliers. Moreover, when these intermediaries relegate some inventory risk back to their suppliers or have contracts that involve revenue sharing, suppliers' payoffs depend directly on how many shoppers the retailers are able to attract, and thus cross-group network effects exist in both directions. Still, they do not qualify as MSPs according to our definition because they do not enable buyers and suppliers to directly contract.

Second, and along the same lines, iTunes is not a MSP even though users care about how many products they have access to through it (music, movies, podcasts, etc.), while music and movie studios care about the number of iTunes users when they decide whether or not to contract with Apple and make their products available through iTunes. Indeed, iTunes behaves mostly like a supermarket: the exchange interaction (music purchase contract) is between consumers and Apple, not between consumers and suppliers, i.e. music or movie publishers. Furthermore, Apple has control over the pricing of digital products sold through iTunes, a key bone of contention with music publishers.

The following table contains a list of intermediaries that are not MSPs in their current form but exhibit significant cross-group network effects. Note that many of these examples (including cable TV and satellite radio companies, department stores, movie theatres and supermarkets) have been classified as two-sided markets in existing articles in the literature, although not always without controversy.

Table 1. Examples of non-MSP intermediaries with significant cross-group network effects

Intermediary	Agent 1	Agent 2	Reason not MSP	Significant cross group network effects
Cable TV Satellite radio (Sirius and XM)	Viewers / listeners	Content providers	Media company takes control over exchange, i.e. sale of channels to viewers/listeners.	Viewers / listeners value more channels; content providers may value more subscribers depending on contracts
Department stores Retail stores Supermarkets	Shoppers	Suppliers	Store takes control over exchange, i.e. sale of products	Shoppers value stores with greater numbers of suppliers; suppliers may value stores with more shoppers depending on their contractual agreements
Movie theatres	Viewers	Movie producers	The movie theatre takes control over exchange, i.e. movie distribution and screening to viewers; marketing role of movie theatre (communication interaction) is not the primary value created	Given the nature of their revenue sharing contracts, movie producers value a theatre that attracts more viewers; viewers may also be attracted to a theatre complex that shows more movies
Retail service firms (e.g. hair salon)	Clients	Employees	Firm takes control over exchange, i.e. contracting with clients	Clients prefer firm with more professionals employed to choose from; employees may value firm with more customers depending on their employment contract
Stock photo companies such as Getty (www.gettyimages.com) and Corbis	Content purchasers (companies looking for photos)	Content contributors (photograp hers)	There is no direct interaction (exchange) between content contributors and companies purchasing content licenses. New contributors sign a one-time contract with Getty Images ¹⁹ and content	Content purchasers prefer a stock company with a large stock of photos to search from; photographers prefer a stock company with lots of customers since they are paid per sale.

(http://www.corbisimages.com/) ¹⁸			purchasers enter into a license agreement with Getty Images. ²⁰	
Traditional video game arcade	Gamers	Game developers	Arcade takes control over the exchange interaction, i.e. sale of the games to gamers	Gamers prefer arcade with more arcade machines; game developers may prefer to license their games to arcades that attract more gamers if they receive payment per usage.

Cross-group network effects are not necessary for MSPs

Conversely, there exist MSPs (according to our definition) that do not exhibit cross-group network effects. One scenario in which this occurs is when the MSP is chosen *after* specific members of the multiple sides have decided to interact with one another. For example, in the case of traditional videoconferencing services, after deciding to interact, the parties involved choose a particular video conference provider to use.²¹ A similar example is small, unbranded on-line ticketing providers such as TicketCity: their online box-office software enables niche event organizers to sell tickets to their customers. Event organizers affiliate by setting up their websites such that online ticket sales are managed by TicketCity; consumers typically only affiliate with TicketCity at the point they need to buy the ticket by going to its website.²²

Another scenario is MSPs that enable a single direct interaction for each member of sides A and B, so that cross-group network effects do not matter. For instance, consider online gift registries such as MyRegistry.com and The Electronic Gift Registry (<http://www.egift-registry.com/>). These sites allow users (gift-receivers) to create registries for a variety of gift-giving occasions (e.g. wedding, baby shower, anniversary, etc.). There are two types of customers – gift receivers and gift givers – both of whom have to affiliate. Affiliation is more costly for the gift receivers, who set up the event, create a list of possible gifts, and invite potential gift givers to sign up. Since the use of the site is one-off for most users (e.g. for their

¹⁹ Getty Images Submission Requirements and Contract Overview: http://contributors.gettyimages.com/workwithus/article.asp?article_id=1346

¹⁸ These companies distribute still images (as well as video footage and music) in digital format from creators (photographers) to entities that wish to use the images on their sites or other communication tools.

²⁰ “License Agreements,” <http://www.gettyimages.com/Corporate/LicenseAgreements.aspx>.

²¹ An online version is iMeet (<https://imeet.com/>), where every user gets a virtual “meeting room” in which she can invite others to conduct video-conference meetings. Guests have access to the meeting rooms they are invited to for free. Consequently, a user’s decision to join (and pay \$69) does not depend on how many other users join, but rather on how many virtual meetings she expects to initiate.

²² Large and well-known ticket service providers such as TicketMaster may exhibit cross-group network effects. An event organizer may expect her event to attract more people if she lists it with TicketMaster: consumers who already frequent TicketMaster’s website may find out about the event through the promotional materials they signed up to receive from TicketMaster. Small ticketing providers do not offer promotional materials to consumers and typically do not even have a consumer brand – they simply focus on offering ticket sales technology at competitive prices.

wedding), they generally do not care about how many members are registered on the other side of the platform, so there need not be any cross-group network effect.

Indirect network effects are not necessary for MSPs

The requirement of significant indirect network effects is a stronger requirement than just requiring significant cross-group network effects in at least one direction between two groups on a MSP, and so is clearly also not necessary for a platform to be a MSP by our definition. Section 2 already discussed advertising supported media for which consumers put zero (or little) value on ads when deciding whether to subscribe to the platform and so do not involve significant indirect network effects but yet remain MSPs to the extent they enable advertisers to "communicate" directly with affiliated viewers/readers over the platform. Other examples include MSPs for which tariffs are charged that insulate one side's decision from the level of participation on the other side, as may be the case for web sites that charge per-click rates to advertisers and nothing to viewers, credit card networks that charge only per transaction fees, or an independent ATM operator that signs up numerous banks and charges consumers and banks only when a customer uses the ATM machine with the particular bank's card.

Cross-group network effects are common in MSPs

Despite the fact that neither indirect network effects nor cross-group network effects are necessary to our definition of MSPs, most MSPs do indeed exhibit significant cross-group network effects, a point that has been made by previous authors. Thus, one could still use our definition in conjunction with a requirement of significant cross-group network effects (in at least one direction between two distinct customer types) in order to focus on MSPs with network effects. From the perspective of the existing literature, the advantage of doing this would be to rule out a broad swath of intermediaries with network effects that are clearly not MSPs (e.g. typical retailers and professional firms), as well as some less obvious examples which we turn to now.

5. Some Case Studies

The value of our definition of MSPs can be illustrated by considering several less obvious examples. Some of the mini-case studies below help illustrate how our definition leads to a

different characterization of MSPs than existing definitions, while others help illustrate how our definition can handle various subtleties.

Supermarkets and department stores

Consider a supermarket or a convenience store that sells shelf space to suppliers and gives them control over pricing and layout. Does this create a MSP? Our definition suggests this is not enough to turn these intermediaries into MSPs. Provided the store still takes control over the final sale of the goods to consumers, the exchange is still between consumers and the retailer, rather than directly with suppliers. Even if suppliers partially dictate the terms of trade with buyers (e.g. through resale price maintenance contracts or other vertical restraints), consumers buy from – and thereby form an implicit contract with – the retailer and not the end-suppliers. Thus, the interactions between consumers and suppliers are still not direct.

Like supermarkets, department stores not only sell the goods of suppliers, they also may allow the suppliers to demonstrate their products to potential customers through their own salespeople (i.e. one-way communication). This exposure of the suppliers' products usually would not turn a department store into a MSP unless it is the primary value the department store creates. But department stores are clearly further along the continuum between retail intermediaries and MSPs than the average grocery store.

Apple's digital marketplaces

Next, consider Apple's iTunes and App Store digital content marketplaces. iTunes allows users to purchase music and movies and play them on their iPods, iPhones or computers. The commercial interactions enabled by iTunes are *not* direct because whenever users purchase or rent music and movies through iTunes, they enter into a contract with Apple, not with third-party music or movie studios.²³ On the other hand, Apple's App Store (for iPhones, iPads and Macs) does enable direct commercial interactions because Apple explicitly states that the contract and liabilities implied by the purchase of applications by users are between users and third-party applications providers, not Apple.²⁴

Amazon

²³ iTunes Terms and Conditions, <http://www.apple.com/legal/itunes/us/terms.html>. (October 11, 2011)

²⁴ App Store Terms and Conditions, <http://www.apple.com/legal/itunes/appstore/sg/terms.html> (October 11, 2011)

Amazon started off as an online retailer, reselling books sold to it by publishers. Clearly it has evolved since then.²⁵ Today, it acts at the same time as: i) a re-seller; ii) a MSP and iii) an input supplier. It is a re-seller when it buys and resells products under its own name. It is a MSP when it enables third-party sellers to sell on its website (and thereby to enter direct contracts with users) and simply takes a cut of the corresponding revenues. The MSP part of the business first developed sometime in 2000-2001, as indicated by the following quote from Jeff Bezos:

“One of the things we had to learn through zShops and auctions was that we needed to think of ourselves as serving two distinct sets of customers. We pride ourselves in being “customer-centric,” but for years “customers” meant “buyers.” As we began to operate auctions and zShops we realized that these third-party sellers were equally important customers. And it took a little while for the organization to learn what their needs were and how we could best serve them.” (Leschly et al (2003), p.7)

Amazon’s recently created Kindle division also functions as a MSP. Kindle e-books can only be obtained through Amazon’s online store, which can be accessed from a computer, mobile phone or the Kindle device itself. The corresponding purchase contracts (licenses to digital content) are between consumers and third-party book publishers,²⁶ which means this is a *direct* commercial interaction enabled by Amazon.com. The consumption interaction happens either on the Kindle device or on a mobile phone or tablet equipped with the Kindle application.

Finally, Amazon also functions as an input supplier when it supplies its Amazon Web Services (e.g. data storage, computing power, APIs for e-commerce applications) to thousands of third-party application developers and website operators, as well as when it operates back-end technology and fulfilment for third-party retailer websites such as Target.²⁷ Thus, Amazon contains all three business models within different divisions of the same organization.

Real estate agencies and multiple listing services

Real estate agencies raise some interesting issues. The example of a single real estate agency in a small town in which it is the only agency operating is a straightforward example of a MSP. The agency enables communication and exchange between buyers and sellers: potential buyers can browse houses for sale listed by sellers on the agency’s website (or physical catalogue), they can exchange information (although agencies typically attempt to restrict direct

²⁵ The material used for this example is based on Leschly et al. (2003) and Huckman et al. (2008).

²⁶ Kindle License Agreement and Terms of Use (September 28, 2011)

http://www.amazon.com/gp/help/customer/display.html/ref=hp_left_sib?ie=UTF8&nodeId=200506200.

²⁷ At the bottom left of the homepage <http://www.target.com/> a small note indicates “powered by Amazon”.

communications up to the point of sale in order to avoid disintermediation), and they can rely on the agency for help with the final transaction (e.g. obtaining standardized contracts and ancillary services). Of course, buyers and sellers contract directly and control the negotiation over key terms of any such contract.

The extent of the value created by the real-estate agency in terms of enabling direct interactions between affiliated buyers and sellers would be even greater (so closer to a pure MSP) if it did not impose any restrictions on buyers and sellers communicating. In this situation, the agency would provide more detailed (perhaps complete) information on one party to the other, and presumably charge a fee for sellers to list and/or buyers to search, rather than a success fee. An example of this approach is www.isoldmyhouse.com: sellers pay a monthly fee for listing their house for sale on the site, while buyers can search and contact sellers for free.

The more complicated but realistic situation, however, is a city in which many real estate agencies operate, so that a typical house transaction involves a buyer dealing with one real estate agency (or individual broker) and a seller dealing with another. In many countries this may be handled through bilateral arrangements in which agents co-broker deals and share in the fees. In the U.S. (and a few other countries), these arrangements between different agencies are handled by a Multiple Listing Service which acts as a MSP on behalf of all the different agencies in a specified geographic area. For such co-brokered transactions, each individual agent by itself does not act as a MSP, but the collective of interlocking agencies does – through the Multiple Listing Service that is created.²⁸

Interlocking MSP: Payment platforms and the Internet

MasterCard and Visa operate similar types of MSPs in acting as platforms that bring together a collection of individual issuers (e.g. banks representing cardholders) and individual acquirers (e.g. banks representing merchants) to enable card transactions between the issuers' cardholders and acquirers' merchants. Thus, as in the case of Multiple Listing Services, it is the interlocking collection of individual players in the industry that together create the MSP.

Another important example of an interlocking MSP is the Internet itself, which can be viewed as a platform that primarily enables users (content seekers) and content providers to directly interact. The platform is provided by a collection of interlocking Internet Backbone

²⁸ See http://en.wikipedia.org/wiki/Multiple_listing_service.

Providers and ISPs, which individually provide access onto and over some part of the Internet for households or content providers, wherever they might be, but collectively provide end-to-end connectivity across the world wide web. The recent debate over net neutrality²⁹ is largely over the extent to which the collective owners of the infrastructure platform can exercise some control over content providers' interactions with users (such as charging them for access to their users, perhaps on differential terms). However, none of the scenarios under discussion would alter the fact that the Internet is a MSP. No scenario involves these Internet backbone providers taking control of the content provided by Apple, Facebook, Google, Microsoft, Yahoo, etc. and selling it to their customers in the way Cable TV companies do with the content they provide to subscribers.

Professional service firms

For most non-retail firms (e.g. packaged food companies), there is never any significant interaction between employees and customers, so such firms are not MSPs. But even when significant employee-customers interactions do exist, they are not necessarily *direct*. Consider a hair salon. One might argue that the hair salon does enable a significant interaction between the hairdresser and the customer: the consumption of the hair-cut service. The contractual relationship associated with this service is, however, between the customer and the salon, not between the customer and the hairdresser (employee). Thus, according to our definition, the key interaction is not a direct one. In contrast, a pure MSP hair salon would involve hairdressers paying the salon to rent space in their facility in which to sell their services (under terms they would control) directly to customers.³⁰ In such a case, the employees would become the MSP's "customers."

More generally, an important category of firms that *can potentially* behave as MSPs is professional service firms, e.g. offering specialized consulting or legal services. The key source of value created by these firms stems precisely from the direct relationships between the associated professionals and clients. Traditional consulting firms like McKinsey or law firms like Clifford Chance are quite clearly re-sellers and not MSPs: they place strict restrictions on the

²⁹ See Lee and Wu (2009).

³⁰ An analysis of the pros and cons of operating hair salons as MSPs can be found at <http://hcds4you.com/blog/booth-rental-is-it-right-for-you/>

way in which their consultants or lawyers can engage with clients and the contractual relationship is between clients and the firms (not their individual professionals).

During the last decade however, a number of new professional services firms have emerged, taking advantage of the Internet to connect clients with professionals. Three examples are the Gerson Lehrman Group (GLG), a-connect (AC) and the Round Table Group (RTG).³¹ GLG connects clients searching for answers to difficult problems (e.g. industrial corporations, private equity firms, asset managers) with specialized experts in a wide variety of fields. AC is a “staffing company” providing the consulting services of independent professionals to clients around the world. Finally, RTG allows law firms and lawyers to search and hire qualified expert witnesses in a wide variety of fields (the firm boasts a network of over 100,000 experts).

At first glance, these firms would appear to be clear MSPs – particularly in contrast to their traditional counterparts – since they enable exchange interactions between clients and experts or professionals in their respective networks, which are not their employees. A closer look reveals – perhaps surprisingly – that they remain at least partly re-sellers. While clients can select the experts/professionals they wish to work with (and experts/professionals must agree), in all three cases (GLG, AC and RTG), there is no contractual relationship for service delivery between experts/professionals and clients. The key contracts are between clients and the professional service firms, which in turn hire the experts/professionals needed to provide a specific service to a specific client. This means that the professional service firm bears responsibility for fulfilling the terms of the contracts, e.g. making sure the clients pay and the experts deliver the agreed-upon service. The key difference between the three firms is in decision rights over the terms of the contracts. While GLG and RTG allow the experts in their networks to set their own fees (typically hourly), AC pays its professionals on a per diem basis, at a rate negotiated between the client and a-Connect.

6. Re-sellers vs. MSP

The requirements and subtleties discussed in detail above are not just for academic precision or for splitting hairs. It is important to realize that the extent to which organizations (especially firms) enable direct interactions is often a decision variable: they can choose where to

³¹ The information about these three firms is based on Eccles and Karadzhova (2009), Eccles and Lane (2008), and phone interviews with RTG.

position themselves on the continuum between re-sellers and MSPs. It is then interesting to ask: what are the factors that drive organizations' decisions whether to be closer or further from a MSP?

Economies of scale and transaction costs

Since the re-seller mode involves more control and influence by the intermediary over direct interactions between the various customer types, it generally carries higher costs relative to the MSP mode – both fixed (capital expenditures) and variable (cost of dealing with each individual interaction). Note that this is true both for physical products and services (the re-seller's higher costs arise from the need to carry inventory and move products around) as well as for digital ones (the re-seller's higher costs arise from taking over product/service liabilities).

This has two implications. First, the MSP mode will be more appealing for intermediaries facing resource constraints, such as start-ups or intermediaries attempting to maximize growth.³² For start-ups there is an important trade-off when the MSP mode involves indirect network effects: while the MSP mode is more capital efficient, it creates the well-studied chicken-and-egg problem which can be particularly severe in the presence of unfavourable expectations (if one side does not join, neither will the other(s), and vice-versa). In such a context, the re-seller mode might be the price to pay for overcoming unfavourable expectations as pointed out by Eisenmann and Hagiu (2007).

The second implication of the higher cost structure of the re-seller mode is that, all other things being equal, the MSP mode is typically associated with higher *percentage* profit margins.³³ This is true not just at start-up, but also in “steady state,” i.e. for mature intermediaries. Amazon provides a good example. Setting aside web services (for which it functions as an input supplier), Amazon started off as a pure re-seller, then progressively evolved towards a hybrid MSP-re-seller model. Today Amazon functions as a MSP for roughly 30% of

³² An example is Gome, China's largest electronics retailer. Unlike its peers in the United States (Best Buy and Circuit City), Gome used a “concessionaire” model with respect to its suppliers: once it built a new store, it sold/rented space in it to its suppliers, who then obtained almost complete control over their respective spaces (cf. Abrami et al. (2007)). This model was very cost-efficient (low capital and operational expenditures), which enabled Gome to add new stores at a faster rate than its competitors.

³³ For example, eBay's profit margins for 2010 were close to 20% on \$9 billion in net revenues, while Amazon's and Wal-Mart's were between 3-4% on \$34 billion and \$405 billion respectively in net revenues. Data from eBay. *Annual Report* (2010), p. 56; Amazon.com, Inc. *Annual Report* (2010), p. 18; Walmart. *Walmart 2010 Annual Report* (2010), p. 30.

the products it channels to consumers.³⁴ The reason for the change was that the company discovered the MSP mode yielded higher margins than the re-seller mode.³⁵

Given the lower costs and higher margins of MSPs, why not move all the way to a 100% MSP mode? The most basic reason is that the re-seller mode can create significant value through scale economies, which the MSP mode misses. To see this, note that by definition, the total transaction costs incurred by buyers and sellers (for an intermediary connecting buyers and sellers) are lower under the re-seller mode than under the MSP mode because a re-seller internalizes a large portion of those transaction costs. In turn, this can only create value overall (social value) and be profitable if the re-seller benefits from economies of scale in aggregating transactions. This is the most fundamental source of value for brick-and-mortar retailers such as Wal-Mart, Target and others: their huge fixed investments in physical infrastructure (warehouses and logistics) allow them to create huge savings in transaction costs, which they can pass on into lower prices. This is also the reason why Amazon continues to invest vast resources in the infrastructure (warehousing, shipping and logistics) for its first-party sales, i.e. the re-seller part of its business.³⁶ At the same time, it explains why if there are many different types of unrelated transactions (as is the case for a flea market, shopping mall or eBay), the MSP mode creates higher total value since it avoids the dis-economies of scale which would arise in trying to aggregate large numbers of idiosyncratic transactions.

Bargaining power and choice

The desirability of MSP versus re-seller mode can depend on whether there are significant asymmetries between the relative bargaining positions of buyers and sellers. If sellers tend to be large due to their own economies of scale (e.g. large manufacturers), it may take a large buyer to be able to negotiate on an equal basis with them. Thus, large re-sellers like Wal-Mart and Target not only achieve lower distribution costs through economies of scale, but they are also able to buy their products at lower input prices from manufacturers due to their strong bargaining positions. On the other hand, to exercise their bargaining power, re-sellers may tend

³⁴ Laura Hazard Owen, "Amazon's Bezos: Mobile Shopping Has Great Room for Improvement," *Paid Content*, June 7, 2011, <http://paidcontent.org/article/419-amazons-bezos-mobile-shopping-has-great-room-for-improvement/>

³⁵ Dan Gallagher, "Third-Party Business Fuels Amazon's Overall Growth," *MarketWatch*, July 25, 2011, <http://www.marketwatch.com/story/third-party-business-fuels-amazons-overall-growth>

³⁶ S. Woo and J. Letzing "Amazon's Growth is Costly," *Wall Street Journal*, July 27, 2011. http://online.wsj.com/article/SB10001424053111904772304576470510839305924.html?mod=WSJ_Tech_LEFTToPNews

to stock only certain manufacturers' products (e.g. through exclusive deals), thereby denying customers as much choice as would likely be offered by a MSP that relies on direct negotiations between buyers and sellers.

Information asymmetries

One central difference between re-sellers and MSPs is that the former can select what and under what terms to (re-)sell to buyers, whereas the latter relies on a market mechanism to determine the terms of trade for buyer-seller interactions. The re-seller model is therefore more valuable if buyers initially do not have full information about the products/services/sellers that are available through the intermediary, if there is very little market information about those products/services and about their quality, or if buyers have limited cognitive ability to process information about products. In this case, the re-seller creates value by providing information, simplifying choice and making search easier. Thus, for example, Best Buy arranges its stores and compensates and trains its sales staff so as to make it easier for consumers to learn about and find electronics products, and to enable them to mix-and-match products from different suppliers (e.g. TV, DVD player, sound system for home theatres). Similarly, Apple iTunes standardized the prices for music and video in order to simplify consumer search and calculations. The assumption is that the latter are likely to buy more songs if all prices are the same (since consumers avoid cognitive costs).

Conversely, if variety and quality are known by buyers so that they know which products/services/suppliers they prefer and they can easily process the relevant information, then the MSP mode is better – it is less costly and simply enables the desired transactions to take place. Given that in practice buyers are a heterogeneous lot, differing in the information they have and their search costs, it is thus perhaps not surprising that we often see both re-seller mode and MSP mode co-existing, sometimes even within the same organization (e.g. Amazon).

Another information-related mechanism in which re-sellers and MSPs work in different ways is with respect to reputation. Suppose that there are information asymmetries between, say, buyers and sellers regarding the quality of sellers' goods and services. One way to solve the resulting adverse selection problem is to provide a market mechanism that penalizes sellers of low quality and rewards those of high quality (e.g. eBay and Amazon rating systems for third-party sellers). But in some cases it might be more cost-efficient for the intermediary to simply

buy the high quality sellers' products and implicitly use its own reputation as a guarantee of product quality, as shown formally by Biglaiser (1993).³⁷

Product complementarities

The re-seller mode may also create more value when there are strong complementarities across sellers' products. These can be consumption-based complementarities (value of consuming product A is higher when product B is also consumed) or they can arise from branding effects (consumers prefer to buy products from one brand that they trust). The re-seller mode can internalize these effects by taking control over pricing, warranties and product placements, while the MSP mode may struggle to do so. For example, retailers will often lay out their stores so that certain hit products are located to attract shoppers to see other related products nearby, so as to generate more sales, even if the related products are from competing manufacturers. On the other hand a MSP that enables competing manufactures to sell directly to consumers could not easily be organized in this way. Indeed, Gome, China's largest electronics retailer (discussed in footnote 29 above), operates as a MSP and organizes its store by brands and not by products, which also means comparison shopping for particular products is more difficult. Similarly, Intellectual Ventures, which offers IP intermediation, adds value by taking full possession of thousands of patents, and bundling closely related patents together to be re-sold or licensed: such patents are much more valuable when combined than when sold/licensed independently (see Hagiu *et al.*, 2010).

Disintermediation

By definition, functioning as a MSP devolves more control to the platform's customers. In some contexts, this creates the danger that customers might dis-intermediate the MSP by interacting directly without its help. This is a real concern for many MSPs and motivates a lot of their practices such as keeping contact information confidential (e.g. Real Estate Agencies), providing integrated payment and seller-rating functions (e.g. eBay), or charging only fixed fees to sellers (e.g. shopping malls). It also explains why professional service firms do not typically function as pure MSPs as discussed earlier: while the MSP mode may lead to higher value

³⁷ A good example is the online shoe retailer Zappos. Originally, Zappos partnered with shoe companies, who held the inventory and fulfilled customer orders. In 2000, Zappos began to abandon this model and stock its own inventory due to two major issues. First, Zappos' inventory information was only 95% accurate, leading to customer frustration. Second, Zappos could not control the shipment of products by vendors: delayed shipments brought customer complaints to Zappos (cf. Marks et al. 2009, p. 10).

creation through closer professional-client relationships, it also puts professionals in a stronger bargaining position vis-à-vis the professional service firm, so that they can extract a larger portion of the value they create or can leave with the clients altogether.

If customers want to deal directly with each other why do they need a platform? The answer could again be search and transaction costs or reputation effects. For individual customers to connect involves higher search and transaction costs. A platform can reduce these costs while still giving customers the flexibility to deal directly with each other. A re-seller intermediary mode further reduces the transaction costs by making each individual customer only have to contract with the re-seller and not with other individual customers.

The Internet can greatly reduce search and transaction costs and therefore allow customers to interact (i.e. contract) directly, whereas previously a re-seller was required to intermediate their trades. For example, traditional book publishers that behaved as re-sellers (buying rights to books from authors and taking control over pricing, marketing and sale to book stores) are under increasing competitive pressure from new, Internet-based publishers that behave like MSPs.³⁸ Sites like Amazon's Kindle Digital Text Platform and Scribd.com enable easy and cheap self-publishing and self-distribution, which means authors can distribute directly to users and have significantly more control over design and pricing. Even in intermediation-intensive industries like banking and payments, MSP alternatives have emerged thanks to the Internet (e.g. online peer-to-peer lending services such as Prosper and online peer-to-peer payment services such as PayPal). Thus, due to technological change there has been a move away from re-selling towards MSPs and, in some cases, all the way to direct selling by suppliers without the use of a MSP.

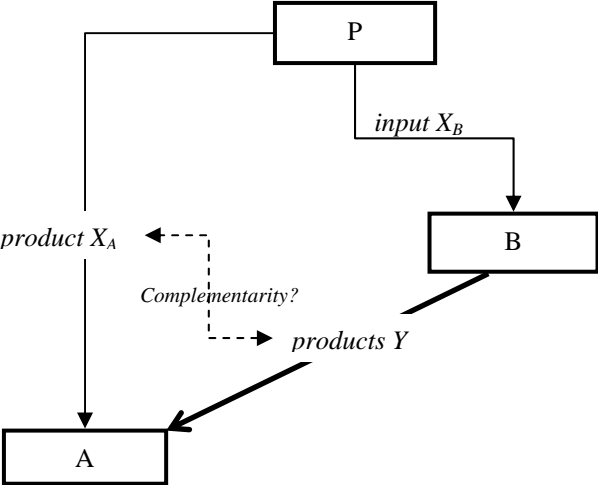
7. Input supplier vs. MSP

Some entities are clearly input suppliers and not MSPs – for instance, E-Ink, mentioned in section 3. In other cases, the distinction is less clear. Suppose a firm P serves two types of customers, A and B, in the following way. Customer A gets a product or service X_A of standalone value from P, while B gets an input X_B from P upon which it can build a new product or service Y. Customer B sells Y to A and A can use Y directly, without affiliating with P in any way. Suppose first that X_A and Y are entirely independent products. Then P is clearly not a

³⁸ G. A. Fowler and J. A. Trachtenberg “‘Vanity’ Press Goes Digital,” *Wall Street Journal*, June 3, 2010. <http://online.wsj.com/article/SB10001424052748704912004575253132121412028.html>

MSP: it does enable a direct interaction between A and B (provision of Y) but to do this A need not be affiliated with P. Thus, P is an input supplier (of X_B to B, which is then converted into Y and sold to A) and a direct seller (of X_A to A). Second, suppose that X_A and Y are strict complements, i.e. one has no value without the other. In this case, P becomes a clear MSP: in order to use Y, customer A must purchase X_A from P, which is a form of affiliation with P. Finally, consider the general case in which X_A and Y are partial complements to each other. Then, as the degree of complementarity between X_A and Y increases from 0 to 1, P moves from being an input supplier to a MSP. This example shows that in some contexts there may also exist a continuum between MSPs and input suppliers. We illustrate the point in the following figure:

Figure 2: Input suppliers vs. MSPs



As a specific example, consider Salesforce, which established itself in the early 2000s as the leading provider of on demand (i.e. web-based) customer relationship management (CRM) software for small and medium-size companies (side A). Starting in 2005, Salesforce turned itself into an input supplier by exposing application programming interfaces (APIs), which enabled external developers (side B) to build on-demand business applications for small and medium-size companies (product Y). The corresponding APIs and other developer services were named the Force.com platform (X_B in our abstract example above). Some of the third-party applications built on top of Force.com are complementary to Salesforce’s CRM application

(product X_A): they enhance its value by offering extended functionalities. Other applications, however, are entirely independent of CRM. These customers can get access to and use them directly from the developers' sites through a web browser. So is the combination of Salesforce's CRM and Force.com a MSP or just an input?³⁹ If the share of CRM-related applications is very small, then it is arguably just an input. If the share is large, then it becomes more like a MSP.

Not only does the distinction between an input supplier and a MSP vary along a continuum, so too is it the subject of strategic choice by intermediaries. The interesting questions here are: how can an input supplier transform itself into a MSP and why would it find it profitable to do so? What (or who) might want to prevent this transformation?

To answer the first question, recall that the key difference between an input supplier (like E-Ink or Brightcove) and a MSP is that while the former does enable direct interactions between two or more types of customers, it only has an affiliation relationship with one type of customer. Thus, in order to become a MSP, the input supplier must find a way to create affiliation by the other types of customers. To see how this would work in practice, consider the examples of E-Ink and Brightcove from earlier, both of which are input suppliers in their current incarnations. In theory, E-Ink would become a MSP in the following alternative scenario. Suppose it offers book publishers a tool enabling them to turn their books into E-Ink e-books, which are then readable by users on any E-Ink-powered device (from Sony or Amazon). Then E-Ink's technology would function as an e-book equivalent of Windows for PCs: it would be a MSP. It might also choose to offer its own e-book store, further expanding the scope of its MSP.

Brightcove could also become a MSP in principle. For example, it could include in its online video technology a feature that required users to create a Brightcove account and sign in whenever they watched a Brightcove video from any content provider site. (It might also allow users to create lists of favourite videos from multiple content provider sites and view, comment and share them on a Brightcove webpage for users.) By doing so, Brightcove would in effect create affiliation by users, the missing link in making it a MSP. Of course, it could expand even further by also selling advertising on its user webpage and syndicating video content to third-party websites in need of video content.⁴⁰

³⁹ Note that Salesforce does run a clear MSP with its AppExchange online store for business on-demand applications. Our discussion is, however, independent of the presence of AppExchange.

⁴⁰ In fact, the company tried but failed to do just that early on in its life. It then settled for being an input supplier.

It is important to emphasize here that in order to become truly MSPs, it is not sufficient for input suppliers to merely create consumer brands. Suppose the producer of an important component X in a product Y begins an “X-inside” marketing campaign targeted to Y’s customers and that, as a result, the latter become willing to pay more for Y products containing X. (Well-known and successful examples of such campaigns include Intel and Dolby.⁴¹) That does not make X a MSP. Y is affiliated with X and X enhances the interaction between Y and its customers in the sense that the utility derived by customers from Y would be significantly lower in the absence of X. But mere brand awareness does not count as affiliation of customers with X. In the case of Brightcove and E-Ink, as explained above, we required some true technological affiliation of a second side in order to turn them into MSPs.

The main reason becoming a MSP might be desirable for an input supplier is in order to gain more leverage/bargaining power over the multiple *potential* customer groups and thereby extract more economic rents. Indeed, in their current forms, E-Ink depends entirely on manufacturers of e-book readers (Amazon, Sony and others) to popularize its technology, while Brightcove depends entirely on premium content providers. Neither of the two companies has its own consumer-facing brand, which means they are essentially held up by the only side that affiliates with them – as that side controls the direct interactions that ultimately create all the value for the platform.

Of course, this is also why any move by an input supplier to become a MSP is likely to be strongly resisted by the one side that is affiliated. Becoming a MSP would diminish the amount of control and leverage that side has over direct interactions with the other side. Indeed, this is precisely why Brightcove failed to create a consumer-facing video portal (strong resistance by content providers who viewed such a portal as competing with their own sites) and it is easy to imagine that Amazon and Sony would strongly resist any attempt by E-Ink to become a sort of Windows for e-readers, which would inevitably commoditize their devices and erode their bargaining power with book publishers.

⁴¹ A less-known but recent one is Corning’s Gorilla Glass, a manufacturer of glass for consumer electronics products: <http://www.corninggorillaglass.com>

8. Concluding thoughts

Several aspects of our formulation of MSPs lend themselves to new research questions and directions, as well as possible policy implications.

In this paper, we focused largely on the implications of the choice between different modes of intermediation (MSP vs. re-seller vs. input-supplier): which mode creates more value, and what drives firms' decisions of whether to be closer or further from a pure MSP? The factors we have identified lend themselves towards formal modelling. Such modelling could also be used to analyse competition between re-sellers and MSPs, which is increasingly being observed (e.g. eBay vs. Amazon vs. Wal-Mart; Apple's iTunes vs. Bandcamp vs. Nimbit⁴²), and what might make one mode drive out another. Furthermore, it is important to note that the different intermediation modes need not be competing against one another. Instead, in some industries they might co-exist in a complementary relationship. One reason might be that small sellers have a hard time competing with larger sellers within a MSP due to lack of scale and reputation. In this context, re-sellers can create value by aggregating supply from many small sellers and relieving them of the transaction costs and hassle of selling themselves through the MSP. This has recently started to happen with used electronics products on eBay. New intermediaries have emerged, which acquire products from one-time sellers through their own websites (e.g. Gazelle, NextWorth) and then re-sell them as PowerSellers on eBay. Deriving the implications of this MSP-re-seller interaction through formal economic analysis should be a promising area for further research.

The requirement of affiliation encompasses what previous authors (e.g. Evans, 2003) call “*getting multiple sides on board.*” If there are cross-side network effects then there is a chicken-and-egg problem in obtaining affiliation by the multiple sides, i.e. getting them on board. If there are no such network effects, then there is no chicken-and-egg problem. Still, there are other strategic issues such as MSP design (which needs to suit the possibly conflicting interests of the multiple sides) and governance of who gets to affiliate and how affiliated members get to transact, which remain largely unexplored by the formal economics literature.

Further, the distinction we make between customer types (at the moment of interaction) and customer groups (at the moment of affiliation) suggests that future models of MSPs could

⁴² Both of these sites are potential iTunes competitors: both are MSPs that allow bands to sell digital music direct to fans by setting up a digital store front and setting their own prices.

analyse platforms that attract customers to affiliate that are *ex-ante* identical but *ex-post* different at the point of usage. Note that in such contexts the notions of cross-group network effects and indirect network effects may not be very well defined even though *direct* network effects may still arise.

Our new definition of MSPs could also matter for the way competition authorities and regulators deal with cases involving multi-sided businesses. As Wotton (2007) details for media cases in the U.K. and Evans and Schmalensee (2007) detail more generally, competition and regulatory authorities have taken mixed approaches in settings identified as two-sided markets or MSPs, sometimes considering both sides of the businesses together and at other times just focusing on one side and wrongly ignoring the other. One reason policy makers may discount a fully two-sided competition analysis is if they perceive the networks in question to be mature (so there is no longer a chicken-and-egg problem to be solved) and therefore they feel not much is lost by focusing on one side and abstracting from the other. Related to this is a possible concern that defendants may overuse the "two-sided market" label to claim two-sidedness whenever network effects arise across different groups of users, in order to criticize a plaintiff's "simplistic" analysis.

Our definition should give policymakers (and courts) a firmer basis for deciding the extent to which a business is a MSP. Regardless of whether networks are mature or not, MSPs necessarily involve the interactions of two or more sides, and so one cannot simply ignore one side when doing a competition analysis. For MSPs, markets should be defined starting from the platforms' interaction service, with the relevant price of this interaction service being the joint price to both parties (e.g. cardholder and retailer in a card payment network, buyer and seller in an online auction, caller and receiver on a telecommunication network, gamer and game developer for games played on a video game console, or ad-viewer and advertiser in a media market).

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