

Two-Sided Markets: Apple's Digital Application Platform

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ABSTRACT

Two-sided markets (or platforms) are defined as the platforms that provide goods or services to two distinct groups of customers, and that intermediate the transactions between these groups. Such platforms are of great importance in today's global business world and considerable amount of value is created by these platforms. The success of numerous firms in the business world, including but are not limited to Google, eBay, Amazon, Microsoft, Apple, Sony PlayStation, Visa, is mainly due to the advantages provided by the two-sided platforms. This paper is devoted to the two-sided markets phenomenon, its basic characteristics, architecture as well as mechanism. The paper explains the aforementioned information regarding two-sided markets by providing the case from Apple's digital application platform. Furthermore, Apple's competitive advantage stemming from this platform has been articulated by the theoretical perspective provided by the Resource Based View (RBV).

Keywords: two-sided markets, network externality, resource-based view, digital application platform, case study.

1. Introduction

Two-sided markets, also known as two-sided platforms (or multi-sided platforms), are one of the emerging business models. In today's economy, a considerable proportion of the value is created by two-sided platform businesses and the community built by them (Evans and Schmalensee, 2007). Examples of such platforms include but are not limited to Google, eBay, Amazon, Microsoft, Apple, Sony PlayStation, Visa, etc. The reason why these companies become so successful and attract millions of people is the ability to bring together distinct groups of customers.

The term is first coined by Rochet and Tirole (2003) and well defined by Evans (2003a, 2003b) as the platforms that "provide goods or services to several distinct groups of customers who need each other in some way and who rely on the platform to intermediate transactions between them" (Evans, 2003a; Evans, 2003b; Rochet and Tirole, 2003). Two-sided platforms are like catalysts in nature. Catalyst, in chemistry terms, is a substance that causes or accelerates a chemical reaction between two or more other agents. The resulting substance has a greater value than the components created it. In addition, the catalyst is not affected by the reaction and does not disappear. Identical to chemical catalysts, two-sided markets bring two groups of agents together to create a value-added platform (Evans and Schmalensee, 2007).

Apple, with its digital application market, has built one of the most appealing platforms in mobile device market. This platform deserves to be named as a two-sided market because of the necessary components that it possesses. This essay is devoted to discuss Apple's digital application platform and will detail the basic characteristics of two-sided markets in this context. The essay will also explicate the architecture of the platform under discussion. Finally, competitive advantage created by Apple's two-sided market will be detailed from the perspective of resource-based view.

2. Two-Sided Market Characteristics

In order for a business to be called two-sided, it should possess several basic characteristics. First and foremost, there should be two different groups of customers that have different objectives and demand patterns. Second, these groups have to need each other in some way and are not able to capture the value by their mutual interaction. Third, an intermediary is needed to facilitate the interactions between these groups in order to create value (Evans, 2003a; Evans, 2003b).

Apple's digital application platform possesses basic characteristics that two-sided businesses should have. Application developers and users constitute the distinct groups of customers (or sides) that Apple has in its two-sided business, or more specifically two-sided business. The objective of application developers is to develop and sell their applications to

mobile phone users. Mobile device users, on the other hand, like to purchase and install applications to their phones. Apple, as the owner of the platform, designs and manufactures mobile devices (i.e., iPhone, iPod, and iPad) and creates online systems (i.e., iTunes and App Store) to bring these two distinct groups together. Without Apple's digital application platform, application developers couldn't have distributed their applications in such an efficient fashion and reached such a big customer base. Mobile device users, on the other hand, couldn't have easily found the applications and/or games that they demand.

However, these basic characteristics are not alone adequate to make a two-sided business successful. Another important aspect of the two-sided businesses is that they must solve the chicken-egg problem (Evans, 2003b; Gawer and Cusumano, 2002). That is, one group of customers can only benefit from the platform if there is satisfactory number of customers in the other group, and vice versa. This is called indirect network externality which is very well accomplished by Apple (Evans, 2003b; Hagiu, 2007; Rochet and Tirole, 2004). Application developers are willing to develop and contribute to the platform because there are millions of mobile device users in the market created by Apple. Mobile device users participate in the platform because they know that there are capacious amount of applications that can operate on their mobile device. However, this has to be coordinated and balanced in some way by the platform owner to create demand from the both sides.

There are three ways or strategies (or three types of two-sided platforms) to coordinate and balance these interactions and to increase and capture indirect network externalities: match-making, audience-building, and cost-minimizing (Evans and Schmalensee, 2007). Match-maker platforms facilitate the mutual transactions. Apple platform enables two groups of customers to find each other, which is an indication of its match-making capability. Audience-builder platforms assemble an audience in order to attract another group of customers to participate in the platform. Apple achieves this by providing mobile devices to consumers. By owning an Apple device, users get access to free functionalities (such as phone, music player, social networking, calendar, online maps, etc.) as well as the capability of downloading the applications of their interest. By accumulating millions of users into its platform, Apple attracts application developers to sell their applications through the iTunes and App Store. Platforms that have cost-minimizing strategy increase efficiency and reduce the transaction and search costs for both sides. Apple's cost-minimizing strategy in its platform is that (1) mobile device users can easily and quickly search and download the applications that they demand, (2) application developers can easily find a customer base to sell their applications by paying no credit card, hosting, and marketing fees.

While creating strategies to attract different customer groups, platform owners should also be cognizant in their pricing strategies. Two-sided businesses cannot implement pricing strategies as a one-sided business, which realizes revenues from only one side. Pricing is a bit more complicated in platform businesses, because two-sided platform owners should determine price for each type of customers. The price should be optimally set, so that each type of customers will be willing to pay that amount and participate in the platform activity. A typical platform owner usually chooses one side as the "subsidy" and charge less or none (Eisenmann et al., 2006).

3. Architecture and Mechanism

3.1. Platform Architecture

Baldwin and Woodard (2008) argue that there are three components of any platform architecture: core components, peripheral components, and interfaces. Core components are the ones with low variety that are fixed and stay stable over time, whereas peripheral components (or complements) have high variety and high rates of change over time. Interfaces are the design rules which enable the core and the complements to work together as a system. Like core components, interfaces are also long-lived and constitute the platform with the core (Baldwin and Woodard, 2008).

Apple's digital application platform in mobile device market has the same set of components in its architecture. At the core of the architecture is the hardware which includes Apple's mobile devices, such as iPod, iPhone, and iPad and operating system (iPhone OS) which includes core services and media layer as well as key frameworks for application development. Soft component of the architecture also includes the user interface, phone application, multimedia applications, internet connectivity and email applications, etc. Frameworks are bundles that contain a dynamic shared library and associated resources, and constitute the interface of the Apple's platform architecture (Apple Inc., iPhone Dev Center). These key frameworks constitute the platform itself and they have high levels of reusability which reduce the need to reinventing the

wheel. Therefore, application developers are able to access these resources with the support provided by Apple. Peripheral components of Apple are the applications created by the application developers. These are highly changeable over time as the demand patterns evolve.

It is of great importance to articulate the standards of the platform architecture. According to the classification of Henderson (2005), there are two sets of standards in platforms: degree of access to component designers (i.e., open and closed) and the mode of control over the use and evolution of the standards (i.e., public and proprietary) (Henderson, 2005). Closed-proprietary standards are only accessible through contracts and agreements with the proprietor. Under the use of such standards, hard or soft components of another system will not work on the proprietary system (Baldwin and Woodward, 2007). Apple's digital application platform is an example of the employment of such standards. Apple is the sole proprietor of its mobile devices as the manufacturer of all of the core components of the platform including the hardware as well as operating system (i.e., iPhone OS) and key application development frameworks. Apple makes contracts with its suppliers (mostly Taiwan based) in order to supply the key hard components of the platform (Chen, 2009). In order to produce the peripheral components of the platform (i.e., applications and accessories), it is mandatory to make agreements and contracts with Apple. Otherwise, Apple does not allow other parties to produce components of its platform. It is not because mobile devices, components and complements are not imitable, but because Apple only allows those producers that agree with the terms and conditions under the contract. For instance, third party applications can be developed through "jailbreaking" which will work on iPhone system (Krazit, 2007). However, this can't be commercialized without enrolling Apple's iPhone application development program.

Closed-proprietary nature of the platform under discussion is also parallel with the issue of design dependencies, which is known as the information needed to produce a new product which works seamless with the existing ones (Woodward, 2008). Teece (1986) identifies two types of dependencies: generic and specialized (Teece, 1986). Unlike the generic case which requires common information to a product category in its design, specialized case requires the information which is closely related to a specific product platform. Apple's digital application platform constitutes a specialized design dependency, in which application developers must have the necessary product specific information in the development of the applications. Application developers can only have this information through contracting with Apple (i.e. subscription as an iPhone application developer) (Apple, iPhone Developer Program). Therefore, application developers who are willing to accept such dependency develop applications for iPhone. Apple is still in advantageous position, because the platform itself has some level of value for the users without the development of the applications (Chen and Nalebuff, 2007).

3.2. Platform Mechanism

As for the mechanism of Apple's platform as a two-sided business, there are two sets of customers that are in need of each other for the creation of value. These two sides are connected to the platform through interfaces, which is only possible by accepting the contractual conditions. If both sides accept the conditions, they can be a part of the platform and benefit from the opportunities and functionalities provided by the platform.

One side is composed of application developers. Application developers, through subscribing as an iPhone application developer, get access to the proprietary information provided by Apple. The tools provided by Apple include Xcode (a development environment providing project management, source editor, and graphical debugger), iPhone simulator (provides a simulated iPhone environment to test the applications), interface builder, and other developer instruments. Apple also provides several resources to its iPhone application developers including forums, getting started videos and documents, iPhone reference library, and coding resources (Apple, iPhone Developer Program). After the development of the application, application developers have several benefits when they are distributing their application through Apple's iTunes Connect, which is a suite for submitting and managing the developed applications (Apple, Developer Support Center). Application developers can (1) determine the price level for each application sold, (2) get 70% of the sales revenue out of their applications, and (3) waive credit card, hosting, as well as marketing fees (developer.apple.com) (Apple, iPhone Developer Program). On the other hand, application developers should agree several terms and conditions, such as restrictions on sharing Apple's confidential information, services, and content (Apple, Developer Support Center).

Mobile device users constitute the other side of the two-sided platform. Users can buy a mobile device (e.g., iPhone) from only the Apple retail and online stores as well as the wireless carriers. The users who own Apple's mobile devices are able

to use the already-installed features as well as the applications that they will download from the iTunes system or App Store.

As the owner of this two-sided platform, Apple coordinates and balances the demand from these two sides with the design and development strategy of its platform architecture as well as its pricing and governing strategy. As articulated by Evans and Schmalensee (2007), Apple executes three types of activities which are more or less implemented by the two-sided businesses: build, stimulate, and govern (Evans and Schmalensee, 2007). First, Apple creates a value proposition for both application developers (an efficient application development opportunity and distribution channel with a large customer base) and mobile device users (a useful mobile device having many functionalities and application choices with easy search). Then, Apple facilitates search and provides information for both sides through interfaces. Finally, Apple sets the rules for the platform and standards for the engagement through contracts and agreements which is mentioned above.

Next section details the discussion of two relevant theories: (1) Apple's competitive advantage from a resource-based view, and (2) Evolution of iPhone platform from the perspective of punctuated equilibrium theory.

4. Theoretical Perspective

4.1. Resource-based View and Apple's Competitive Advantage

Resource-based view (RBV) is one of the most widely used theory in strategic management. Firm resources are "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991; Daft, 1983). The basic premise in RBV is that resources that firms possess determine the organizational performance (Barney, 1991). However, only possessing resources is not enough to create competitive advantage in the marketplace and sustain it. Sustainable competitive advantage can only be achieved, if a firm creates valuable and rare resources which are not imitable and substitutable. It is the resource heterogeneity what makes firms different from others and create competitive advantages over competitors (Barney, 1991).

RBV as a theoretical lens has been recently articulated and implemented in the context of two-sided markets. Eisenmann et al. (2007) examined RBV in the context of platform envelopment, which is defined as "entry by one platform provider into another's market" (Eisenmann et al., 2007). It is argued that it is very difficult to enter into an already established market which has the network effect and switching cost advantage. Another way to enter into the market is through leveraging the shared user relationships and common components. From an RBV perspective, the paper discusses that a company's customer base is one of its resources which create competitive advantage. In particular, two-sided markets, where network effects are of great importance, should have a greater user base to achieve advantages. Eisenmann et al. (2007) proposes the platform envelopment approach for a firm to enter into a market which is achieved by using the competitor's customer base overlapping with its user base. By employing this approach, firms do not need to rely on fundamental innovations (Eisenmann et al., 2007).

There is another research study which uses RBV as the theory base and which treats customers as the fundamental resource of the two-sided firms. In this research, research heterogeneity and isolating mechanism are discussed in RBV context and network effect is introduced as the basis for these mechanisms in the two-sided platforms. They argued that customer relationships are one of the critical firm resources which create network effects and which creates competitive advantage for such businesses (Sun and Tse, 2009).

The problem with these two research studies is that they propose customer base of firms as competitive advantage creating critical resource. According to resource-based view, it is the firms' internal resources and capabilities which create competitive advantage (Barney, 1991). Customers are usually viewed as the external resources of firms which may not be controlled like internal resources. That is why, it is of great importance to examine RBV in the context two-sided markets by considering platform owner's internal resources and capabilities as resources creating competitive advantage.

Apple, as the owner of a two-sided platform, is a very successful firm in the mobile devices market with millions of devices and billions of applications since its launch. Apple's success in this market is basically coming from its two-sided business strategy based on its digital application platform. Because of the reasons enunciated below, this platform possesses four

conditions (i.e., value, rarity, inimitability, non-substitutability) of RBV that are required to create competitive advantage over competitors.

The first condition of RBV is the value of the resources (Barney, 1991). Apple's platform has a great value which is created with a two-sided philosophy. The value proposition to both sides of the market enables Apple to attract these two distinct groups of customers into the platform. This indirect network externality enables Apple to accumulate millions of users as well as application developers in creating an enormous ecosystem of dependencies (Evans, 2003b; Hagiu, 2007; Rochet and Tirole, 2004). The value of the platform is also created by setting the standards to make the platform closed and proprietary, which differentiates from the other platforms.

The second condition in RBV is that the resources should be rare, so that competitors cannot own a similar resource (Barney, 1991). As mentioned above, Apple sets a closed-proprietary standard for its platform and makes contractual agreements with its suppliers as well as two sides of the platform. Such being the case, nobody can do business with Apple without making contractual agreements which creates rareness. Another factor creating rareness is the mobile device itself. The mobile devices having various functionalities attracts millions of users into the platform which enable Apple to operate and promote its application development side of the platform, which in turn help balancing the two-sides of the platform.

The third characteristic of RBV returns is that resources should be inimitable (Barney, 1991). As mentioned, even if there are some ways to imitate mobile devices, such as iPhone, or their various components, it is difficult to commercialize it. In addition, it is not enough to imitate Apple's architecture because managing the two-sided platform is also an inimitable advantage because of the fact that the relationship between the form resources and competitive advantage may not be understood by the competitors (i.e., causal ambiguity) (Barney, 1991). Other inimitable resources of Apple are its innovativeness and marketing strategy. Through innovativeness, Apple always designs cutting-edge technology which always attracts large customer base (Nussbaum, 2008). Through innovativeness, Apple designed iPhone and competitors could only start to imitate and design similar phones after two years of iPhone launch. While competitors try to imitate iPhone and try to identify the weaknesses of the device, Apple use this time to innovate more and continuously improve the device (Malone, 2010). Effective brand management and market positioning enable Apple to have a valuable brand which is the most important resource to imitate.

Finally, firm resources should be non-substitutable to create competitive advantage (Barney, 1991). In this context, Apple's mobile device platform is not substitutable because there is no any strategic equivalent platform having similar or same characteristics and functionalities. Although similar mobile devices have been designed and launched in the market recently, they could not reach the success that Apple achieved because of the fact that they could not follow a two-sided platform strategy as Apple did.

4.2. Dynamic Perspective

Baldwin and Woodard (2008) argue that, like biological systems, platform systems also evolve over time (Baldwin and Woodard, 2008). Apple's capability to leverage its two-sided platform towards advantage over its competitors did not happen instantly. Apple's mobile device platform, with its architecture as well as mechanism, followed an evolutionary path, which can be explained by a dynamic resource-based perspective (D-RBV) (Helfat and Petaraf, 2003).

D-RBV perspective suggests that firm capabilities follow the path very similar to the product life cycle (founding, development, maturity, and branching) (Helfat and Petaraf, 2003). When iPod is introduced in 2001, Apple's capability was in a founding stage. iPod was designed as a portable music player in which users can install the music that they want and download from the Internet onto it. As years progress, more users purchased iPods as Apple designed and marketed new versions of it, which is an indication of development of the capability. In 2003, Apple introduced its iTunes Store, in which users can directly download music into their iPods. Apple experienced a maturity with this store, which was first attempt to its two-sided business strategy, albeit the business was one-sided (Apple as the direct seller of music files to consumers).

D-RBV suggests that after a capability reaches to maturation, a firm has several branching strategies (retirement, retrenchment, replication, renewal, redeployment, recombination), which can lead to a diminishing or increasing levels of its capability and competitive advantage (Helfat and Petaraf, 2003). Apple chose a renewal strategy. In 2007, Apple launched its iPhone and App Store for users to download music, applications, games, and other digital content. Until 2008, this was still a one-sided business since third party applications were not allowed on iPhones. In 2008, Apple launched its Application Developer Program and provided developers with a set of tools and frameworks to encourage application

development. Since then, Apple's iPhone platform has two sides and follows a two-sided business strategy. With its growing and evolving capability on two-sided strategy, Apple's competitive advantage seems to be sustainable.

5. Conclusion

Two-sided markets have recently become important aspects of the economies throughout the world create substantial amount of value to its customers as well as the platform itself. The characteristics and mechanism possessed by these platforms allow firms to have a competitive advantage in the market.

This paper is devoted to the two-sided markets phenomenon, its basic characteristics, architecture as well as mechanism. The paper explains the aforementioned information regarding two-sided markets by providing the case from Apple's digital application platform. Furthermore, Apple's competitive advantage stemming from this platform has been articulated by the theoretical perspective provided by the Resource Based View (RBV).

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