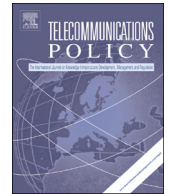


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Platform openness and the productivity of content providers: A meta-frontier analysis

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ABSTRACT

This paper analyzes the platform environments in which content providers (CPs) may succeed by using a meta-frontier analysis that compares the efficiency of different groups in identical industries. The results illustrate that a group focusing on an iOS platform achieves a high average efficiency with low variance within the group because the iOS ecosystem manages the content novelty and uncertainty risk in the selection process. This quality control enables a CP to maximize value once the CP enters the ecosystem. From the meta-frontier viewpoint, however, Android-group firms have a higher efficiency level than iOS-group firms. Android transfers risk management to CPs who can conduct additional trial and error, causing CPs to endure the tough selection process. This explains the low initial technical efficiency, but in the long term, this group has the potential to achieve high efficiency. In addition, the group providing content to both platforms was the most efficient group because of the economies of scale.

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1. Introduction

The information and communication technology (ICT) industry consists of four layers: content, platform, network, and device (C–P–N–D) (Arlandis & Ciriani, 2010; Fransman, 2007). Content layers in the ICT industry can be characterized by a great diversity of activities including music, books, games, films, television broadcasting, cultural spaces, software, and advertising (Abadie, Maghiros, & Pascu, 2008). Content flows via a platform and arrives at a device through a network. Recently, because many people mainly consume content on their mobile “smart” devices (Westlund, 2010), the most important success factor for network, device, and platform operators entails which media brands, applications, and content they provide (Feldmann, 2005). In addition, a decisive factor of customer surplus is derived from new combinations of products or services (Curran & Leker, 2011). These phenomena reflect that negotiation power and the power of innovation are shifting toward the content layer among the four ICT layers (C–P–N–D). The innovation and increased efficiency of the content layer may attract more consumers and increase the profit gained from the other three layers (Arthur, 1989).

Even though the effect of innovation in the content layer of the ICT ecosystem is growing, the other layers are no less important. Because all four layers are connected with each other, whether one layer succeeds or fails influences the whole

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ICT ecosystem (Moore, 2006). Therefore, it is important to support the stability of every layer in order to innovate and develop ICT (Iansiti & Levien, 2004a; Katz & Shapiro, 1994; Tiwana, Konsynski, & Bush, 2010). Additionally, managers and policy makers in the ICT ecosystem should develop a strategy that aims at growing the entire ecosystem, understanding mutual dependence and the principles of co-existence and co-prosperity (Iansiti & Levien, 2004a).

Specifically, the platform layer is directly relevant to the innovation and development of the content layer (Hilkert, Benlian, & Hess, 2011). In the mobile industry, the platform-based ecosystem is rising and accelerating because the interaction between many developers and customers is only possible through a platform (Gawer & Cusumano, 2012). The platform mediates the content and consumers and therefore plays a pivotal role in a two-sided market; content providers and consumers are on both sides of the platform (Eisenmann, Parker, & Van Alstyne, 2006). A two-sided market has the following two characteristics. First, it possesses direct network externality in which a consumer feels that a product or service is more useful when many people around him or her use the product or service (Katz & Shapiro, 1994). Second, a two-sided market is characterized by positive feedback through indirect network externality. When a consumer plans to buy a product with increasing returns in the production of complementary products, he or she behaves as if there were indirect network externalities (Clements, 2004). This indirect effect alters the consumer's utility function before purchasing the product. If there is a critical advantage of applications in a particular smartphone ecosystem, it gradually locks in customers and makes the ecosystem more attractive. This positive feedback reinforces the advantages of a relatively large platform ecosystem (Arthur, 1989; Katz & Shapiro, 1994). Therefore, a platform ecosystem could attract developers and users, providing the environment in which services and products can be created well and therefore adding more value to the system (Katz & Shapiro, 1994). For example, a platform provider (PP) attracts more consumers when it has more creative content providers (CPs). Likewise, because CPs also need more potential customers, they will choose a PP that has more customers.

Considering the information above, which platform environment will allow content providers to grow most efficiently? Currently, the two prominent mobile platforms, Google Inc. (referred to as Google in this paper) and Apple Inc. (referred to as Apple in this paper), play a common role in facilitating market communications between CPs and consumers. However, they have different policies on the evolutionary direction of platform ecosystems. From the content provider viewpoint, the main difference between these two platforms is the content selection process. The evolutionary process consists of two major steps related to variety and selection. The different platform policies result primarily from the selection process, referred to as openness in this paper. If a platform controls all content quality, it plays a significant role in decision making when the content enters the ecosystem. The evolutionary selection step process would not be fully open to consumers because the consumers cannot participate in choosing the content already selected by the platform provider (PP). However, if a platform allows content providers to enter freely, consumers or content providers then play the selection role, rather than the PP. This selection scheme causes the ecosystem to evolve differently.

Iansiti and Levien (2004b) introduced a productivity index for the assessment of the health of the entire ecosystem and they also demonstrated that the productivity of the Internet service layer plummeted when platform firms, such as Yahoo and AOL, began to charge abnormal fees to their third parties. Consequently, PPs pursued short-term profits rather than long-term optimization of the global ecosystem and the entire ecosystem collapsed during this period. Therefore, it is clear that a platform's characteristics and policies alter the nature of the ecosystem and the productivity of the third parties. However, empirical research from the CP perspective regarding which platform ecosystem is better for CP innovative performance and efficiency is lacking. Numerous prior studies focused on PPs (for example, see Cusumano & Gawer, 2002; Eisenmann, Parker, & Van Alstyne, 2008; Gawer & Cusumano, 2012; Iansiti & Levien, 2004a, 2004b; Xu, Venkatesh, Tam, & Hong, 2010) provided insights on how a firm may obtain platform leadership and the role of the leader firm in the growth of the overall ecosystem. However, there is a lack of conclusions at the industry level regarding the overall ecosystem (Basole & Karla, 2012; Tiwana et al., 2010), and there is little literature studying participants at the periphery of an ecosystem (Selander, Henfridsson, & Svahn, 2013). There are also several limitations when focusing only on the theoretical part or phenomenon or visualizing an ecosystem network analysis. There are several papers that focus on CPs in a platform ecosystem, such as Hilkert et al. (2011); however, these are primarily surveys and interviews that have limitations in terms of suggested implications. Therefore, there is a need for an empirical analysis of how CP performance varies depending on platform chosen.

Therefore, this paper empirically analyzes how two PPs with different levels of openness influence the efficiency of CPs in the mobile digital content industry. It aims to determine which characteristics of the platform make CPs more productive from the evolutionary perspective. To show the existing differences between CP productivity within iOS and Android, this paper uses surveys to gather data from 102 mobile content providers in Korea. The content providers are categorized into three groups (providing content to only iOS, to only Android, or to both platforms) to compare the technical efficiency within each group and between the groups. In academia, this paper will provide the information that prior research could not provide and will present strategic implications for CPs operating through mobile platforms. In addition, we hope to derive meaningful implications from this analysis for telecommunications policy makers to promote the innovation and growth of the content industry.

2. The framework of the platform ecosystem

2.1. The concept of the platform ecosystem

The concept of the platform ecosystem varies depending on the industry perspective. For example, Gawer (2009) defines a platform as a building block, which can be a product, a technology, or a service that is able to develop a complementary

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