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Factors affecting application developers' loyalty to mobile platforms

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ABSTRACT

Mobile platform providers, including Apple and Google, have grown quickly to become central players in the mobile ecosystem. They now act as gatekeepers of information among multiple niche players in the mobile ecosystem. Many players from different industry sectors have tried to build their ecosystem centered on their own mobile platform, but only a few have succeeded so far. In the so called 'ecosystem war', one of the key issues for platform providers is how to retain a sustainable relationship with other niche players in the ecosystem. This paper investigates the factors influencing application developers' loyalty to mobile platforms. To do this, this paper develops a model with key variables based on loyalty theory and adds variables that reflect the specific context of mobile platforms. The empirical analysis that was conducted in South Korea shows that satisfaction is a direct antecedent of application developers' loyalty to a mobile platform. The results also show that the quality of a mobile platform's software development kit (SDK) is one of the important determinants of application developers' satisfaction with a particular mobile platform and also of the platform's credibility. However, there is no significant relationship between the credibility and loyalty, which is not consistent with previous studies in different research settings. This provides us a clue to understand how the mobile platform market works and that mobile platform providers have less incentive to create a fair relationship with developers when they have a large customer base.

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1. Introduction

The mobile ecosystem consists of a variety of parts, including network operators, device manufacturers, platform providers, content providers, and application developers. Traditionally, network operators played a key role in the mobile ecosystem (Basole & Rouse, 2008); however, with the widespread growth of smart phone use, mobile platform providers, including Apple and Google, have grown quickly to become central players (Calem, 2010; Ghezzi, 2012).

A mobile platform provides not only an operating system (OS) but also a software development kit (SDK), application programming interface (API), and user interface (UI) to multiple players in the mobile ecosystem (Evans, Hagi, & Schmalensee, 2006). A mobile platform thus enables them to do various businesses on the mobile ecosystem and creates diverse relationships with other players.

A mobile platform enables application developers or contents providers (CPs) to easily develop contents, applications, and services, by providing an environment in which the developers can have easy access to network data, such as a network global positioning system (GPS) and personal information about users'

devices. While providing those basic functions, a platform provider requires all applications go through its authorization process to be listed in its application market, such as App Store and Play Store. Users then download and install those contents and applications to their devices.

A mobile platform also is closely related to the device makers. Some makers, such as Apple and Blackberry, have their own mobile platforms while others, such as Samsung and LG Electronics, do not. In case a device vendor uses a third-party platform, a close relationship is made between those two parties, and they share their interests. For example, it is well known that Google and Samsung have collaborated closely to promote Android. Google also requires device vendors who use the Android Compatibility Test Suite (CTS) verification process.

A relationship with a mobile carrier is also important for platform providers since mobile carriers still have strong distribution channels for devices and the power to choose applications to be preinstalled. A carrier billing contract between a mobile carrier and Google is a typical example that shows how platform providers consider their relationship with mobile carriers. A 'carrier billing contract' is a contract giving users an option to receive a bill for applications purchased in the Android market along with their telecommunication service bill (such as that of SK Telecom).

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Table 1
Global Smartphone operating system market share (%). Source: Gartner, 2014.

| | 2008 | 2009 | 2010 | 2Q 11 | 4Q 11 | 2Q 12 | 4Q 12 | 2Q 13 |
|------------|-------|-------|-------|----------|----------|----------|----------|----------|
| Android | 0.5 | 3.9 | 22.7 | 43.4 | 51.3 | 64.2 | 69.7 | 79.0 |
| iOS | 8.2 | 14.4 | 15.7 | 18.2 | 23.6 | 18.8 | 20.9 | 14.2 |
| Microsoft | 11.8 | 8.7 | 4.2 | 1.6 | 1.8 | 2.6 | 3.0 | 3.3 |
| Symbian | 52.4 | 46.9 | 37.6 | 22.1 | 11.6 | 5.9 | 1.2 | 0.3 |
| BlackBerry | 16.6 | 19.9 | 16.0 | 11.7 | 8.8 | 5.2 | 3.5 | 2.7 |
| Bada | – | – | – | 1.9 | 2.1 | 2.7 | 1.3 | 0.4 |
| Others | 10.5 | 6.1 | 3.8 | 1.0 | 0.8 | 0.6 | 0.3 | 0.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Previously, users were only allowed to pay for applications by credit card via a Google account.

In the meanwhile, there has been an intense battle in the mobile platform market; each player in different industry sectors has been looking for ways to become the choice for other players in the mobile ecosystem (Basole & Karla, 2011). The number of mobile platforms was estimated to be over 40–50 in 2010 (Calem, 2010), but now they have converged into a few big players. According to Gartner, Android had 79.0% of the global market as of 2013 (2Q), followed by iOS (14.2%) and Windows Mobile (3.3%). Table 1 shows the change of the market share since 2008.

In spite of its importance, previous studies of mobile platforms have mainly focused on technological perspectives (e.g. Ghezzi, 2012) or have made strategic suggestions (e.g., Gawer & Cusumano, 2008). There have been only limited studies on the relationships between platform providers and other stakeholders. This paper focuses on the relationship between mobile platform providers and application developers and investigates the factors that affect that relationship. In the mobile platform market, once a strong relationship between a platform and developers is established, a platform provider can also attract more customers, device vendors, and mobile carriers – a “virtuous circle” can be created in its ecosystem (Basole & Karla, 2011). Therefore, in order to survive and grow in the so called ‘ecosystem war’, it is very important for platform providers to understand how they can create and sustain a positive relationship with developers.

The purpose of this paper is to investigate the factors influencing application developers’ loyalty to mobile platforms. To do this, this paper develops a model with key variables based on loyalty theory and adds variables that reflect the specific context of mobile platforms. Assuming that application developers are customers who use the platform, this paper borrows key concepts from loyalty theory. This paper also introduces the mobile platform-specific constructs such as SDK quality, convenience, compatibility, market opportunity and fairness, and investigates their relationships with key variables based on loyalty theory. The hypotheses are empirically tested by collecting data from a survey in South Korea. This paper finally investigates the regulatory aspect of the relationship between platform providers and application developers.

The remainder of the paper proceeds as follows. Section 2 briefly reviews the theoretical background and investigates and hypothesizes mobile platform specific variables for a research model. Section 3 follows with a description of the data collection and methods of the study, and Section 4 provides analysis and results. Section 5 concludes with implications in terms of business strategy and regulatory concerns.

2. Literature review and research hypotheses

2.1. Loyalty theory as applied to mobile platforms

The subject, how to maintain customer loyalty, has been one of the main research topics in business academia. In the early stage of

loyalty study, researchers focused on the customers’ loyalty with tangible goods (Caruana, 2002). Recently, the concept of loyalty has been broadened to customers’ loyalty with intangible services such as banking services (Hallowell, 1996; Oliver, 1999). In particular, loyalty theory has been applied to service industries and new businesses: telecommunications (e.g., Sweeney & Swait, 2008) and e-commerce (e.g., Gommans, Krishnan, & Scheffold, 2001). This paper applies loyalty theory to the mobile platform industry, assuming the application developers (i.e., customers) will choose a mobile platform and repeatedly and mainly develop applications on that platform.

According to the literature on loyalty (e.g., Dick & Basu, 1994; Yi, 1991), customer loyalty has two distinct dimensions: customer attitudes (how much customers are satisfied with a firms’ product or service) and customer behavior (customers’ actual repurchase of the product or service). Thus, in terms of attitudes, customer loyalty is perceived as future intention-to-repurchase (Gommans et al., 2001).

In the mobile platform market, developers need to prioritize their resources since those resources are limited (e.g., time, financial, and human resources), and because the applications they develop are generally only compatible on one platform and would need to be modified for other platforms. Thus, loyalty to a mobile platform can be defined as intention to continuously use a platform as the main platform on which they develop and upload applications. This study investigates the relationships among the loyalty related variables (i.e., satisfaction, credibility, and loyalty) in the context of mobile platforms. Moreover, this study introduces and investigates the relationships between the mobile platform-specific constructs, including SDK quality and market opportunity, and loyalty related constructs.

2.1.1. Satisfaction and loyalty

A lot of marketing researchers have treated satisfaction as a valuable variable (Oliver, 1999) and a critical focus for effective marketing programs (Yang & Peterson, 2004). The satisfaction that customers have with products and services has been considered the main step for building customer loyalty. Satisfaction is defined as the consumer’s response to the evaluation of the perceived discrepancy between prior expectations and the actual performance of the product as perceived after its consumption (Hallowell, 1996; Tse & Wilton, 1988).

The association between customer satisfaction and customer loyalty is one of the most essential relationships in marketing theory and practice (Nysveen, Pedersen, Thorbjørnsen, & Berthon, 2005). Higher satisfaction has been proposed to be related to higher loyalty (Ball, 2003), and found to be related to higher loyalty in many previous studies (Ball, 2003; Cassel & Eklof, 2001; Hallowell, 1996; Strauss & Neuhaus, 1997). Although this relationship is clearly distinct, we also hypothesize this since this is not examined in the mobile platform context. Therefore, the following hypothesis is developed.

H1. Developer’s satisfaction is positively related to developer’s loyalty to a platform.

2.1.2. Credibility and loyalty

Building brand credibility is a long-term and continuing investment by a firm (Erdem & Swait, 1998, 2004). Credibility generally refers to the believability of the brand. Customers think the company credible when a company does what it says it will do (Herbig & Milewicz, 1993).

There have been many studies that suggested that credibility has an effect on loyalty, and it is considered a significant variable in reducing switching behaviors among customers (e.g.,

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