Landslide Effect: A Perspective for Mobile Service Engineering

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Abstract—As the complexity and uncertainty of service engineering has increased in the Internet business, the importance of ecosystem engineering has increased as well. The last decade of mobile service engineering has witnessed multiple large power-shifts in mobile business. The dynamism in the industry landscape represents a challenge to research that seeks to identify the driving factors of business model engineering. From a retrospective view of the past decade of mobile service engineering, it is important to identify the driving factors that enable destructive innovation in mobile service engineering. The dynamism is the result of the fast changing mobile service landscape, and it is also the driving factor of these changes. The author proposes the concept of the landslide effect in order to parse the impact of large power-shifts in the mobile business. First, the mobile-specific factors of this dynamism are discussed. Then, a research model that includes this aspect of mobile service engineering is presented.

I. INTRODUCTION

The mobile Internet has been one of the most dynamic areas of technology and business in the past decade. The stickiness of end users, transitions in network infrastructure, and mobile content have enabled this dynamism. It started with i-mode, which was a wireless carrier’s attempt to grasp the core of the mobile Internet. It was followed by i-Phone, an integrated user experience with eco-system build-up such as the App Store. The closed-ness of embedded software engineering provided closed business models in the past. The closed-ness also provided an opportunity for radical change because there were many third-party content providers looking for business opportunities outside the closed circle.

The dynamism in the last decade caught the author’s attention because these changes provided landmark shifts in the center of power of the mobile business. The author came to recognize that mobile business model engineering relies on these power shifts, because it is difficult to change the power balance built up during transitional phases.

Davis proposed the technology acceptance model (TAM) in order to provide a valid measurement for predicting user acceptance of computers [1]. TAM is one of the most widely used prediction models for information and communication technology acceptance today. Hsu et al applied a TAM that incorporates social influences and flow experience [2].

Since the Internet emerged, destructive innovation has been more common than in the pre-Internet days. The industry has been aware of this trend [3], however, there have been few systematic approaches to parse this trend.

In order to capture the characteristics of such transitional changes, the author proposes the concept of landslide changes. The author gives the definition and driving powers of landslide changes. Then, the author provides the implications from the proposed concept.

II. BACKGROUND

A. Purpose of Research

The aim of this research is to identify the key factors that drive the successive mobile service adoption during the transient phase.

B. Related Works

Wireless telephony is one of the quickest-spreading technological artifacts worldwide. It is an interpersonal communication gadget that quickly prevails when the wireless telephony is adopted as an interpersonal communication method. This property also has an impact on the high degree of dynamism in mobile service adoption.

Mobile services emerged in Japan, and they have captured the attention of industry and research since their launch in 1999. Natsuno discussed the win-win relationship among content providers and carriers in the early stages [4]. Barnes analyzed the early stage success of wireless Internet services in Japan and discussed the Japanese-specific driving factors [5].

Mobile social games emerged since their OpenSocial-based launch in late 2009. The author discussed a three-stage view model of the architectural evolution of mobile social games in Japan [6]. He also discussed the business model engineering in the era of human interaction networks [7]. Okazaki et al analyzed branded entertainment in Japanese mobile SNS [8].

The STOF model with Service, Technology, Organization, and Finance is a frequently-used model for mobile business analysis [9] [10]. The investment-intensive nature of the mobile service industry is changing due to its service orientation, emerging service ecosystem business engineering, and the availability of cloud computing. New models that identify the dynamism and help us understand high level service engineering are required.
The adoption of mobile services with a service dynamism has not been covered very well in the past literature. The originality of this paper lies in its examination of the factors given in the transient phases that drive the successive mobile service adoption.

III. Observation

A. i-mode

The launch of i-mode in 1999 opened the era of mobile business in Japan. The timing was aligned to the growth in the number of wireless users. Large numbers of new users started to use i-mode, and the mobile Web.

The standard equipped micro-browsers enabled users to access the mobile Web. This large influx of mobile Web users facilitated the early stage of mobile content business.

The rapid growth enabled the easy adoption of new usage behaviors. In this case, wireless telephony growth at the time of the i-mode launch helped the adoption of the mobile Web.

How to manage a large number of new users is a critical key to mobile service adoption. In the case of i-mode, the wireless carrier NTTDOCOMO hosted i-mode services, and therefore, the dominant power of this wireless carrier was used to leverage the use of the mobile Web.

Large numbers of new users rushed to the i-mode portal where they adopted the use of i-mode services.

B. Mobile Application Store

Apple launched the App Store in July 2008. This strengthened Apple's position in the mobile industry by enforcing the unbundling of mobile applications. In many embedded software domains, software was built in the form of special-purpose embedded software. This increased cost and maintenance burdens, in a closed market.

Thanks to advances in technology, Apple successfully created a new paradigm, with an application platform and an application distribution mechanism. This eliminated software creation and maintenance burdens for Apple, as a handset vendor, and reduced its time to market. It also provided rich revenue opportunities for third-party vendors with a growing worldwide market for the iPhone.

The App Store stimulated the rise of new application stores created by Google, Nokia, Research in Motion, Samsung, LGE and others. It shows the large-scale bandwagon effect created by the App Store, not just for application vendors, but also for many potential application store providers. Instead of investing in the closed embedded software engineering, they created an application market that provides revenue opportunities for third-party vendors.

It has also provided new opportunities for content providers because content providers can distribute their content together with the content player in the App Store.

This shows an interesting mixture of open and closed business models. From the viewpoint of an open business model, it is a liberation of mobile application markets. Anyone who subscribes with Apple has an opportunity to publish applications for a globally growing market with high market visibility. From the viewpoint of a closed business model, the market is tightly controlled by Apple.

The swarming effect of unbundled applications also increases visibility in the market and aggregates the effects on user behaviors.

The landslide effect enables the transition from closed embedded software engineering to open embedded software engineering. The legacy closed embedded software paradigm with feature-phones was replaced by open application-store-based software engineering.

It should be noted that the increasing hardware capabilities of handsets and the OSS-based advanced software environment would gradually turn the paradigm sooner or later. However, visible changes in application stores combined with the smash-hit success of iPhones definitely triggered a large-scale industrial change in the mobile software industry.

C. Mobile Social Games

There are three major SNSs in Japan. Two of them originated as mobile SNSs. The other was quickly shifted to a mobile Web-based UI and the majority of accesses came from mobile micro-browsers in 2006. They started to adopt an open platform strategy in late 2009, publishing their OpenSocial-based APIs to third-party vendors.

This adoption of OpenSocial platform has leveraged the boom of mobile social games in Japan. The mobile social game business has come to the center of IT start-up business in the past couple of years.

The success of revenue-generating engines in mobile social games comes from familiarity with the mobile Web, flat-data rates, and wide coverage of high-speed mobile broadband. Also, it is important that the user segment of mobile social games has low sensitivity to payment. The large number of new users quickly adopted a positive attitude toward payment in mobile social games.

In this case, the question of how to manage this large number of new users is answered through the interactive education among the users themselves. Techniques in Gamenics theory also leveraged the adoption of payment using incremental managed learning embedded in games.

Large numbers of new users rushed to the portals of SNSs, where SNS providers guide users to popular games. Major Japanese SNS providers successfully created revenue-generators with their in-house games, using the power of their portal.

IV. FACTORS THAT DRIVE MOBILE SOCIAL SERVICE ADOPTION

A. Analysis

Factors of mobile service adoption are depicted in Table I. The factors that drive the landslide effect are depicted in Table II.

A stage model of landslide effects in the mobile Internet in Japan is depicted in Fig. 1.

These three changes drastically impacted the mobile business landscape and produced many new players. Some of
the players have grown to be as competitive as the major media players of the 20th century such as advertising agencies, newspaper companies, e-commerce companies, and TV broadcasting companies.

B. Definition of Landslide Effect

The landslide effect is an effect which occurs when a large number of incoming users start to use a certain type of service. The threshold for new behavior adoption is low and the time for adoption is short. This effect enables a turning point in mobile business because a large number of users emerges with new service sensitivities emerges.

![Fig. 1. Stage model of landslide effects in Mobile Internet.]

C. Implications from Landslide Effect

In many cases, the landslide effect plays an important role in mobile service adoption. In the case of the i-mode launch in Japan in 1999, a landslide effect was one of the key factors. At the time of launch, there were millions of new wireless telephony users every year. The installed-base of i-mode was quickly adopted as value-added services in wireless telephony. If the service was introduced to the established wireless telephony users, it might be difficult to drive the adoption of an i-mode service.

In any wireless telephony, there is a time span during which a user is waiting for an incoming call. During that time, the user wants to kill time. This was the service that i-mode provided. The bundled i-mode service quickly filled this gap of time.

At the time of the App Store launch in 2008, the App Store ecosystem provided the driving power for application store adoption and thus, Apple demonstrated a landslide effect in impacting the acceptance behavior of third-party applications on the iPhone. The separation of handset manufacturing and third-party application development leveraged the short time to market because the handset vendor, Apple, did not need to consume a large span of time in developing applications, most of which an end user would not use.

At the time that OpenSocial-based mobile social games were launched in 2009, there were millions of new mobile SNS users every year, partly because of newly added mobile social games. Item-purchasing business models were pursued intensively during the increase of mobile SNS users. This collection of users quickly adopted item-purchase payments. The mass of payment-tolerant users played an important role in the rapid growth of the item-purchasing market for mobile social games in Japan.

The number of Facebook users grew quickly worldwide toward its 1 billion users. However, it lost payment adoption opportunities during the growing phase, and therefore, the payment rate of social games is an order of magnitude smaller than that of mobile social games in Japan.

Mobile services have limitations in terms of the user interface. This leads to the difficulty of learning about the user experience. With a landslide effect, there is a collection of users with coherent user experiences and shared behavior norms in mobile services. This helps minimize the negative effects of obstacles to mobile service acceptance and payment acceptance.

The formation of the acceptance attitude during a drastic service infra-structure change is a non-negligible factor in mobile service adoption. In addition to the service-by-service value positioning, it is important to promote service adoption during the time that a landslide is in effect.

A large user segment with the same length of service experience, helps facilitate the smooth adoption of mobile services.
The existence of large number of followers impact the marketing, education, and customer care of services. This also impacts the fundamental service adoption patterns during the period of the landslide effect. In addition, since followers have limited knowledge about the service itself, it is possible that this phenomenon may have some common and universal characteristics to leverage the design principles of mobile service engineering in general.

V. Discussion

A. Advantages of the Proposed Approach

The previous technology acceptance model did not consider the large group of users that is created when new services arise. A large user group is introduced to a new service, through which the large user group quickly adopts a coherent attitude towards service acceptance.

The author argues that the existence of large number of followers is the fundamental and universal aspect of mobile service engineering. The proposed model accommodates this characteristic of mobile service engineering.

This also highlights the fact that the dynamism in mobile service engineering is not a transitive and superficial phenomenon, but that it accommodates a key underlying factor for successful mobile service engineering in general.

Social influence is one of the contributing factors of persuasion. The landslide effect indicates that social influence from the creation of a large user group of followers has an impact on the drastic changes that occur in mobile service acceptance. The status of a follower was considered to be a secondary factor in the existing research model. The proposed model incorporates the assumption that such a factor is the primary driving factor in mobile service adoption.

The status of a follower is more observable than other complicated ecosystem factors. Therefore, if the assumption is right, a landslide effect can be measured by the ratio of following activities. This will eliminate the identification problem of landslide effects.

B. Limitations

This study is a qualitative study. The verification of a research model of landslide effect-impacted attitude formation remains for future studies. Quantitative analysis of the proposed model requires further studies.

Landslide transitions took place three times in the last decade within the mobile Internet industry. Even so, this type of destructive innovation more frequently takes place in the mobile Internet, it is, therefore, difficult to present a quantitative analysis of the large-scale destructive service innovation. The methodology to identify such a timing in order to make reasonable quantitative analyses is beyond the scope of this paper.

VI. Conclusion

Mobile services witness a drastic conversion of a large group of users into a service-adopted group. During this abrupt transition, the large new and upcoming group forms
a coherent attitude towards services that is not observed in other situations.

The landslide effect needs to be clearly identified for mobile service engineering because the dynamism in the mobile service domain further leverages its importance as a factor in service adoption.

The author proposes a definition of the landslide effect. A landslide effect is the formation of a coherent attitude towards services. This is a key factor during transitions, of which service transitions are some of the most crucial business engineering factors in mobile service business.

Then, the author proposes a landslide-effect-based technology acceptance model. This opens up new subjects for research in service engineering within the mobile service domain.

The quantitative analysis of the proposed model is beyond the scope of this paper.

REFERENCES


