Gate Opening Effect: Toward Understanding Mobile-Specific Service Evolution

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Abstract. There is an increased presence of Internet business players on the mobile Internet, such as Apple and Google. The different players are exploring different business models in the emerging mobile Internet. With increased convergence toward the Internet, the mobile business engineering is involved in a new type of business model engineering. The author compares the business models of mobile platform software. The author describes the role of enabler in mobile business model engineering. Then, the author proposes a gate opening effect in deploying the enabler from the viewpoint of the enabler's role in business model engineering in the emerging new Internet.

1 Introduction

The mobile Internet has become increasingly visible in the mobile industry and in the Internet industry. The mobile Internet has taken steady steps into the mainstream of the Internet. This represents a global landscape change on the Internet and in business model engineering.

This increasingly visible change has attracted major players in the computer and communications industries to mobile business engineering. Major Internet players such as Apple and Google have triggered ecosystem changes in the mobile industry. Sometimes, it has been seen as another attempt to dominate the emerging new business arena.

When NTTDOCOMO launched its i-mode service in Japan with a walled-garden business model-based carrier-portal, its ambition was considered to be to become the center of the mobile Internet. When Google announced its Android project, it was considered to be extending its realm into the mobile Internet. From the point of view of business model engineering, these are not accurate analyses.

The author presents a high-level view of business model engineering on the mobile Internet. Then, the author discusses the role of enablers in the business model engineering. In this context, the author proposes a new type of business model engineering, a so-called gate opening effect-based engineering, which is important for facilitating landslide transitions on the mobile Internet.

R.-S. Chang, T.-h. Kim, and S.-L. Peng (Eds.): SUComS 2011, CCIS 223, pp. 169–177, 2011.

2 Purpose and Related Works

2.1 Purpose of Research

The mobile Internet continues to converge to the PC Internet even with multiple mobile-specific constraints. The aim of this paper is to identify convergence-specific business model engineering to facilitate a large-scale transition of mobile business model engineering.

2.2 Related Works

As mobile business including the mobile Internet business has expanded its coverage and demonstrated its growth opportunities, mobile business issues have caught the increasing attention of researchers.

Natsuno discussed the win-win relationship in the i-mode success [6].

Raivio discussed new business opportunities for mobile operators [8] from the STOF model. STOF stands for 'service', 'technology', 'organization', and 'finance'. This model suits mobile service engineering, which requires both technological and financial considerations. The author considers the limitation of this model in terms of mobile service evolution with a landslide effect on the mobile Internet.

Infrastructure changes and their accompanying business model changes also have attracted attention of researchers.

Regional differences on the mobile Internet have also captured attentions from researchers. Barns discussed the Japanese specific factors on the i-mode success [1]. Zhao discussed the integration of mobile business in China using an entertainment business case [9]. Lu discussed the mobile business value chain in China [5]. Bouwman discussed the barriers and drivers in mobile data services based on a survey [2].

Dhamdhere discussed the Internet ecosystem from the point of view of the links among Autonomous Systems [3]. Kim discussed the "keystones" and "flagships" in the business ecosystem in regards to the role of IT in the business ecosystem [4].

In the IT context, a shared platform is key for business ecosystem engineering. Quaadgras discussed the platform role in business ecosystems using an RFID case [7].

To the author's knowledge, little has been addressed to analyze the underlying principle of driving mobile services during a transition period.

The originality of this paper lies in analyzing business model engineering from the viewpoint of an indirect landscape transition on the mobile Internet.

3 Landscape

Google launched Android in November 2007. Apple launched the App Store in July 2008. Symbian launched OSS-version Symbian^3 in February 2010.

NTTDOCOMO launched i-mode, a Japanese mobile Internet service, in 1999. NTTDOCOMO is a Japanese wireless carrier. It should be noted that i-mode is an enabler of the mobile Internet. NTTDOCOMO invested a lot in i-mode content. NTTDOCOMO had the early feedback data from users, and weekly content subscription statistics. It used this quick feedback with content providers in order to improve the early content. It was sometimes viewed as a content aggregator with a carrier portal

site. We can see i-mode as an enabler on the mobile Internet. Apparently, the major revenue stream for carriers is network traffic revenue. The business model of wireless carriers is to maximize network traffic revenue.

Google created OSS-based Android and a third-party application market, Android market. Here, we can see another example of an enabler. The major revenue stream of Google is search engine-based advertisements. Their business model is to maximize their search engine-based revenue. They have no intention to make a revenue stream out of Android, a mobile software platform. Android is an enabler to leverage a departure from SMS and the closed mobile Internet. Google is confident that end users will use their services once they get into the open Internet. There is no need to bundle any of their services or advertisements into the software platform.

The current business model analysis is presented in Table 1.

Table 1. Business model analysis

item	Carriers	Apple	Google	Microsoft	Vendors
Services and content	Sub revenue		Main revenue		
Portal and billing platform	Sub revenue	Sub revenue			
Network	Main revenue				
Client OS			Engaged	Main revenue	
Client device		Main revenue	Sub revenue	Sub revenue	Main revenue

4 Enabler Analysis

4.1 Definition

An enabler is a mechanism used to implement the prerequisites for a certain outcome. An enabler is a component that through its capabilities or actions allows something else to achieve something. Usually the outcome is a revenue generating mechanism. An enabler is the underlying infrastructure or condition for deploying transitions. In the software domain, an enabler is often the infrastructure or user agent software used to produce web content.

4.2 Importance of Enabler in Mobile Business

The mobile business needs to address multiple constraints on the mobile Internet. The layers involved in managing mobile-specific business components and their issues are

Table 2. Issues in Mobile Constraint

Eco-system management	Allocate the role and revenue relationships among stakeholders. Create new revenue opportunities for coming stakeholders to enhance the eco-system.
Constraint management	Manage multiple constraints such as CPU, memory, network bandwidth, battery life, display real estate.
Enabler Deployment	Manage deployment underlying infrastructure, mobile-specific content, and client capabilities

depicted in Table 2. An enabler is important in this domain because it is difficult to one killer application in the mobile constraints. THe mobile constraints make the aggregation of context-specific applications the best solution for end users.

The business structure is depicted in Fig. 1.

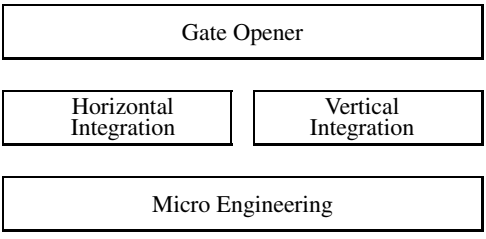

Fig. 1. Mobile Business Architecture

An example of each business structure is depicted in Table 3.

Table 3. Examples of each business structure

Gate Opener	Enable opening boundary gate in order to ensure the ultimate core revenue streams while facilitating enablers on the mobile Internet.
Horizontal Integration	Aggregate a wide range of applications.
Vertical Integration	Integrate services from lower layers to higher layers.
Micro Engineering	Transform the current business models into different business models to ensure future revenue generation.

Table 4. Comparison with enabler

Item	description
Enabler	In IT, it is a component (hardware, software) to allow something (content) to achieve its goal.
Value-chain	It is a chain of activities for a firm operating in a specific industry. Products or services pass through all activities of the chain in order, and at each activity the product or the service gains some value. The chain of activities gives the products more added value than the sum of added values of all activities.
Core competence	It is a specific factor that a business sees as being central to the way it, or its employees, works. The three criteria are: a) It provides consumer benefits, b) It is not easy for competitors to imitate, and c) It can leverage many products and markets.
Ecosystem	In business, it is a set of businesses functioning as a unit and interacting with a shared market, together with relationships among them.

4.3 Comparison with Other Approaches

Value-chain analysis is similar to enabler analysis. The difference is that the value-chain is a shared relationship among stakeholders to create value, and that the enabler is a unidirectional relationship with a final result. Whether the enabler is built into the value-chain relationship depends on the power structure or business contexts. In some cases, enabler analysis is similar to value-chain analysis.

The comparison is depicted in Table 4.

The core competence focuses on the uniqueness of the business position for capturing revenue. The value-chain focuses on the explicit interactions among stakeholders. The ecosystem also focuses on the positive and interrelated relationships among players with different roles. The ecosystem is the closest to the enabler, however, the enabler focuses on the pre-requisites and on facilitating relationships.

The important point of the enabler discussion is that the utilization of an enabler can generate mainstream revenue in an indirect manner in the end.

4.4 Gate Opening Effect

The wireless telephony industry has two different landscapes, one in developed countries and one in emerging countries. In the developed countries, the telephony service is saturated and data services penetrated quickly. In the emerging countries, the large-scale incoming users enable any type of region-specific service development, which may be different from that of developed countries.

In the former case, we can see increasing visibility of the Internet players. Microsoft wanted to create a Microsoft network in 1990's, but they gave up. With more than 90 % share of operating system and browsers, Microsoft could not stop the penetration of the Internet to PCs. The same situation is occurring with the mobile Internet. The increasing presence of service providers and decreasing presence of wireless carriers is something that happened with the fixed line Internet a decade ago.

When a closed market is replaced by an open market, we can see the gate opening effect. In the gate opening effect, it is more important to accelerate dynamism than to build each business model. It is true in the case of i-mode, and the Android case. The exception is Apple iPhone case which includes branding and marketing issues, however, it is beyond the scope of this paper to include discussion about this exception.

5 Business Models

5.1 Vendors and Carriers

Apple's business model is based on vertical integration. The core business is handset sales, however, vertical integration to enclose end users is key. Vertical integration and enclosure of end users with special computing tastes was the success of Macintosh in the 1980's. For this purpose, Apple does not license their technologies to competitors Marketing to persuade end users to become devoted Apple fans is a crucial part of this business. The total taste and flavor of computing are sold with a high price tag. Therefore, the ceiling for this kind of marketing share of this kind is 10 % or so. Apparently, Apple is not interested in the dominant market share, but in a high profit margin.

Google Android is quite different from the Internet Explorer of Microsoft. Microsoft competed with Netscape communications, fearing that browsers could come to act as replacements of the client OS. Google's core business is the advertisement revenue of Internet search engines. Therefore, whether Android occupies a major share of mobile handsets or not is not a critical issue for Google. There are a billion PCs worldwide, at the same magnitude as the number of TVs. There are 5 billion mobile handsets worldwide, with increased connectivity to data networks. With increased capabilities to connect to the Internet, Google cannot ignore the size of this mobile market. Google has confidence that users will come to Google search engines when they are connected to the non-walled garden mobile Internet. Departures from SMS and the walled garden mobile Internet is key. For example, Google maps is one of the killer services for iPhones.

Microsoft has a strong influence on PC software using its flagship Windows OS and popular Office software suites. Microsoft provides wide coverage of enterprise computing as a client platform. It is a natural extension to provide client software that is similar to a PC to mobile devices including mobile handsets. In the past, this was a challenge due to the restrictions of CPU and memory restrictions.

Nokia has marketing channels and a worldwide brand. Nokia has a competence for integrating a wide range of mobile-handset engineering skills and knowledge covering weight, wave interference, battery life, various device drivers, and real-time processing. Unlike Apple and Google, it is not a service-business company, which has 24-hour service operating skills.

Wireless carriers are under a regulated business. With the emergence of the mobile Internet, wireless carriers acted as the most influential stakeholder, with control over handsets. Even though, many wireless carriers took the role of mobile content aggregator seriously in the early days, the wireless carrier's main business model is traffic revenues. It is the most important interest of wireless carriers to maximize their traffic revenue. The mobile content business is just a side interest for them considering the size of their traffic revenue.

5.2 Business Model Engineering

The patterns of business model engineering are depicted in Table 5. All of the services, except gate opening, are also applicable to other business domains. These services can be applied to the PC Internet. The gate opening business model engineering is crucial in the era of device convergence. This model only applies to the industry-leading players. Although the scope of application is narrow, this business model engineering appears to be crucial on the mobile Internet, especially during the landscape-level changes.

The number of users of wireless telephony worldwide reached 5 billions. The number of mobile Internet users is expected to quickly catch this number in the future. Despite this high rate of penetration worldwide, the mobile Internet has a large gap between service design and user acceptance. This is partly because the screen real estate is limited and services are forced to be context-specific.

It should be noted that the mobile Internet services were largely focused on this gate opening effect in the early stages. Current mobile service engineering is also heavily impacted by this effect, as witnessed by Google mobile service engineering.

There are two reasons for this:

- The number of wireless telephony subscribers (potential mobile Internet users) is too large, therefore, the landslide effect of gate opening has a significant impact on business model engineering, and
- Since the penetration rate is high, it is difficult to satisfy the end users with content made from scratch. Therefore, the landslide effect of gate opening has a significant impact on business model engineering.

Table 5. Patterns of Business Model Engineering

Item	description	example
Create new services	Create new services from a scratch. Provide a new choice for consumers.	Create new intermediary marketplace like e-marketplace, price comparison, viral marketing or auction.
Financial engineering	Turning a revenue stream under a different payment mechanism.	Rental/leasing. Application service providers (ownership to pay-per-use).
Conversion of revenue flow	Turning a revenue flow into new patterns.	Sell a cheap machine and expensive supplies e.g. printer business.
Reengineering of value-chain	Inclusion or updates of value chain to perform reengineering of revenue flow patterns.	Turn handset-bundled applications to third-party application distribution in the application market.
Gate opening	Enabling a drastic landscape change that causes the facilitation of core competence in the long-term in the larger picture.	Provide new technology in order to make landslide change of business patterns.

6 Discussion

6.1 Advantages of the Enabler Analysis

The advances in computer and communication technology enable global scale changes in an efficient manner. In this emerging landscape of technology, it is more important to conduct business engineering of an enabler, in the context of the gate opening effect.

In the mobile services context, diffusion can require a complicated process including activation, use and adoption. There are many examples of mobile services where activation does not mean use. Underlying enablers which are required for activation are implemented, but not used. Even with wide use, there are many cases where services are deployed in almost all handsets, however, end users have almost no intention to use them. Bilateral video conferencing services have been widely equipped in many Japanese 3G phones since 2002, however, their use has been slim.

In many cases, micro-value-chain analysis is not effective in mobile business engineering. Much of mobile business engineering is dynamic and does not fit the static, micro-value-chain analysis. In many regions, mobile business continues to change the landscape, network infra-structure, user experience, and business models. Also, the existence of large-scale content and services presents a challenge to any closed business

models because the conversion of existing services and content has a landslide impact on mobile business. This transitive nature presents a never-ending challenge to any static mobile value chain analysis.

In the past decade, i-mode was often referred to as a win-win example of ecosystem success with the mobile Internet in Japan. In retrospective, it is worth reconsidering this win-win ecosystem framework. I-mode services have brought significant network traffic revenue to NTTDOCOMO. Contrarily, many start-up companies that focused i-mode services have been just wiped off from the market, from either launching failure or failure during service evolution. The author believes that it is more appropriate to get a viewpoint of enabler business model engineering from i-mode service engineering.

6.2 Driving Factors of Gate Opening Effect

Device convergence has been eliminating the boundaries between different devices. The increased visibility of Internet players is another factor. A human being is an integrated existence, whether or not he/she uses any device. And, this integrated existence exercises the purchase decisions.

6.3 Implications from Gate Opening Effect

From the viewpoint of a business model, the gate opening effect need to be carefully considered. The major players play a strategic game to build a large-scale convergence to leverage their mainstream revenue. It is risky for many other players to capture this at the surface level to run the long-term business growth. When a gate opener works, there is a risk that the whole service landscape under the legacy constraints needs revisits. It is different from value-chain analysis because the enabler is not designed to create a revenue flow, but to act as the gate opener for a business model transition.

6.4 Limitations

This is a descriptive study of the stage-specific business model engineering of mobile data services. The identification of stages and quantitative analysis of stage-specific comparison of the gate opening strategy and other economically-justifiable strategies are beyond the scope of this paper.

This is an exploratory work, therefore, in-depth analysis of the gate opening effect remain for further research.

7 Conclusion

The mobile Internet requires complicated business model engineering. Since the PC Internet preceded the mobile Internet, it has been a continuous challenge to determine how to utilize the content and services from the PC Internet, in the mobile Internet context. Also, with its increasing rise worldwide, the mobile Internet has been an ambitious target for many major Internet business players. In past literature, the STOF model has been frequently used for ICT business model engineering that involves service development with technological, organizational and financial considerations. The author argues

that past lessons show that service engineering needs to address a landslide transition in the development of mobile services.

With the availability of large-scale content on the PC Internet, the business model engineering on the mobile Internet has a tendency to have a landslide effect for major stakeholders. It is of vital interest for such players to facilitate enablers for this transition. From the analysis of i-mode and Android business models, the author proposes the concept of enabler analysis. It is different from value-chain analysis because the enabler is not designed to create a revenue flow, but to act as the gate opener for a business model transition.

The author describes the past examples involving i-mode and Android to identify the uniqueness of the enabler from the standpoint of a business model.

References

1. Barnes, S.J., Huff, S.L.: Rising Sun: iMode and the Wireless Internet. CACM 46(11), 78–84 (2003)
2. Bouwman, H., Carlsson, C., Molina-Castillo, F.J., Walden, P.: Barriers and drivers in the adoption of current and future mobile services in finland. Telematics and Informatics 24(2), 145–160 (2007)
3. Dhamdhere, A., Dovrolis, C.: Ten years in the evolution of the internet ecosystem. In: IMC 2008: Proceedings of the 8th ACM SIGCOMM Conference on Internet Measurement, pp. 183–196. ACM, New York (2008), http://doi.acm.org/10.1145/1452520.1452543
4. Kim, H., Lee, J.N., Han, J.: The role of it in business ecosystems. Commun. ACM 53(5), 151–156 (2010), DOI http://doi.acm.org/10.1145/1735223.1735260
5. Lu, Y., Dong, Y., Wang, B.: The mobile business value chain in china. In: ICMB 2008, p. 24. IEEE Computer Society Press, Los Alamitos (2008)
6. Natsuno, T.: The i-mode Wireless Ecosystem. John Wiley & Sons Inc., Chichester (2003)
7. Quaadgras, A.: Who joins the platform? the case of the rfid business ecosystem. In: HICSS 2005: Proceedings of the Proceedings of the 38th Annual Hawaii International Conference on System Sciences, p. 269.2. IEEE Computer Society Press, Washington, DC (2005), DOI http://dx.doi.org/10.1109/HICSS.2005.693
8. Raivio, Y., Luukkainen, S., Juntunen, A.: Open telco: a new business potential. In: Mobility 2009: Proceedings of the 6th International Conference on Mobile Technology, Application & Systems, pp. 1–6. ACM, New York (2009), DOI http://doi.acm.org/10.1145/1710035.1710037
9. Zhao, X., Chen, S.: Integration of mobile business and traditional business to acquire competitive advantages: A case study in china entertainment industry. In: ICMB 2008, p. 29. IEEE Computer Society Press, Los Alamitos (2008)