

A Vertical View of Social Structure on Location-utilized Mobile Games

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Abstract—The mobile Internet emerges and penetrates into every day life. The difference between the mobile Internet and the PC Internet is interesting. It is also important to capture the business model differences if any exists. The author focuses location-based game applications to highlight the mobile specific service development issues. The author proposes a framework model to position location-utilized game applications. This provides a good framework how they can address and utilize mobile specific features for the mobile data service engineering.

I. INTRODUCTION

The mobile Internet penetrates into the every day life. It also continues to expand the CPU, memory, network bandwidth and additional capabilities. The additional capabilities like e-payment, contactless IC-card, 2-dimentional barcode, camera, and GPS provide an interesting opportunity to make mobile business. The author describes location-game category which encloses some core users in Japan. The games are free and needs some business model development with the sustained core users. There are many mobile-specific capabilities to leverage user experience, which are promising areas for exploiting the mobile Internet specific characteristics. The business model challenge is the critical factor to cope with in order to enhance the mobile-specific data services. Then the author presents the business model screw in the early stage of mobile data services.

II. PURPOSE AND RELATED WORKS

A. Purpose of Research

The purpose of this research is to identify a framework model of location game with implications of business models.

B. Related Works

Mobile handsets are characterized by its mobility. One of the context-aware applications is location-aware ones. Utilization of location is a key factor to capture user's information needs [1].

The location awareness can be utilized in location-aware games. Boll discussed a GPS-equipped mobile device game experience as a map-associated special navigation game [2]. Mansley discussed a location-aware game in the view of three key components of location-aware game platforms [3]. Rashid focused on cellular phones and discussed technical details to

deal with location granularity [4]. Lindley discussed a trans-reality game utilizing pervasive, mobile, ubiquitous, location-based and mixed reality technical infrastructures to create game spaces [5]. Silve discussed hybrid reality and location-based game with two examples to exploit games spaces in urban environments [4].

From a business model perspective, Bernardos proposed a model of location based services in order to cope with the variety of technologies and business models [6]. Bernardos also presented a framework for user experience, market and business concerns to analyze the mobile location services [7]. Wang presented the local business orientation as one of the unique mobile commerce characteristics as well as dynamic user context [8].

Japan was recognized for many years as a leading edge of location based services including security, navigation and gaming [9].

Even with the prior high expectation, the adoption of location-based services is limited. Junglas presented the difficulty to acknowledge usefulness in an innovative service with the location service example [10]. De Reuver presented a generic business model design issues in service, technology, organizational and financial domains based on interviews to address this gap [11].

The originality of this paper lies in exploring the location-based games in mobile handsets from a mobile business perspective, especially highlighting the skew in the mobile business in order to compensate the lack of revenue flow. It is unique in considering emerging new social structures and interactions.

III. METHOD

The author analyzes the location-based game in order to identify the components and configuration in the area. Then the author presents the location-game dilemma as the general phenomenon for the early stage of mobile data services.

IV. OBSERVATIONS

A. Landscape

There is an emerging trend of location game in Japan. There were 108 million wireless telephony users in Japan in May 2009. There were 102 million 3G users and 3G penetration ratio among total wireless telephony users reached 94 %.

However, this fast mobile broadband penetration does not yet turn the real broadband services take-off. It takes time to make a take-off and let users accept a new paradigm of mobile services.

The location-based mobile content is catching end users' attention, however, the business model engineering to secure the revenue stream is still in an early stage.

B. Mobile Kuni-tori-gassen (Warring States Game)

It is a mobile game with the number of users in the range of 100-150 thousand. The subscription is free. It is a location-based orientation game. Japan is split into 600 virtual provinces based on the historical Warring States Period. Before 2008, the number of provinces was 300. A user goes to some place and press a registration button, then the place becomes a user's territory. The location of carriers' wireless antenna is used to register the user position. Therefore, a user without GPS-empowered phone can enjoy this game. The goal of the game is to register all the virtual provinces in Japan as a user's territory, which means the "unification" in the Warring States Period. In order to win the game, a user needs to visit as many as provinces. Some of the users visited more than 100 provinces, and top players reached all 600 provinces in Japan. It was reported that more than 60 users reach this goal as of May 2009. It is estimated that it cost 5-10 thousand dollars to cover various expenses to reach all 600 provinces. Therefore, the huge cost a user bears to go to the travel industry, not the game service provider. In this game, the game is operated by a map service company. Originally, it was a seasonal game from July to August to aim at the summer vacation. The service was launched in July 2005. Since April 2008, the season limitation was removed. A user can play all the year.

4 % of users are teen-agers. 33 % of users are age more than 35. This is because it costs a lot to enjoy this game or a user is a business traveler. From one perspective, it is an adult game.

C. Colonial Life Plus

The number of subscribed users of Colonial Life Plus was 200,000 in May 2009. The monthly increase rate was approximately 20 %. The monthly page view in May 2009 was 280 million.

This service was launched in May 2005. The subscription is free. This service also uses carrier antenna position as well as GPS to register the user location. When a user registers at a location, a user can get some virtual money called *plug*, and can purchase some souvenirs. The origin of this game, Colonial Life was launched by an individual in May 2003. The business is turned to the company style in October 2008. It is one of the front runners of location-based game in Japan. There are 525 location dependent souvenirs in the game.

This game is characterized by several characteristics:

- No privacy violation: no user privacy info is collected including email address
- Colony development game: only users with physical intimacy can have communications

- Contribution from users is the main revenue stream
- Affiliate advertisement is used, but not much impact on revenue yet

D. Antename

This is operated by an individual, especially for mobile handset. The subscription is free. The game uses the real transportation distance as a game factor. There is occasionally a game event for team play. For example, a team with the biggest total transportation distance will win, depending upon an event type. It is estimated that the number of users is in the range of multiple thousands. The total transportation distance for a 14-day event reached 560 thousand km, with the maximum individual one reached 20 thousand km. The user number is not public, however, it is estimated in the range of 1000-5000.

E. Business Model Skew

The major mobility game (or traveling game) is characterized with the high user satisfaction in a specific context, however, it also exposes a severe business model skew. All the three location-based games are subscription-free. On the other hand, to pursue a game goal, a user uses a significant amount of money which does not cover any cost at the service provide side. The real experience of traveling adds a significant amount of user satisfaction as well as some sort of social competition. The reality constraint is an important factor of game balance in these games.

It should be noted that this skew sometimes occurred in the past during the mobile business evolution. At the early stage of mobile data services, packet-exchange extensive games showed a phenomenon so-called *pake-shi*, literally means packet-death in Japanese. With some monthly 2 or 3 dollar battle game, a user may encounter the monthly packet charges from 100 to 1000 dollars. It was also true in music and video download in the early 3G era. The 3G provides easy download of music or video, however, the packet tariff system did not cope with it, which meant a shock at the bill in the next month. The camera-equipped phone's photo transfer facility also leveraged these situations. Pake-shi was a popular word in Japanese youth in 2001-2003. During pake-shi era, it was no wonder that many carriers put significant efforts to explore new services which may generate a huge revenue source for them at least in a short term.

F. Business Model Development

There are two ways to resolve this skew in the mobile business development:

- Sponsorship
- Hierarchical Member System and Star Economy

One of the major business models of resolving the revenue flow skew is to make the sponsorship. Mobile Kuni-tori-gassen has sponsors like a railway company which enjoys the revenue from these traveling game events. Colonial Life Plus also many local sponsors to provide location-specific advantages.

The other business model development is to use so-called Star-economy.

Star-economy is a game eco-system in which a user with the top rank rating obtains special honor and social attention. The rating itself does not have any economic rewards, however, when there is something quantitative is given in some context, people start to compete to win the good rating. It is called *Star-economy* which was coined by Motoi Okamoto, a SNS company executive, who originally worked in Nintendo. This word was widespread in Japan when it was picked up by a famous game journalist Kiyoshi Shin.

Star-economy is based on the user behavior that people tend to compete with ranking figures, even if the ranking itself does not provide any economic values. This is a common phenomenon which can be found in a wide range of game systems. XBox's gamer score is one of such examples. The word Star-economy is coined when many Japanese young users of Nintendo DS (age 5 to 10) were excited with the user generated flip-movies with user rating of one-star to five-star according to the other users' views.

It is difficult to change the direct revenue flow in the skewed business model development. As far as this scene persists, all these business models will eventually decrease and disappear. In order to exploit the mobile-specific characteristics and maintain some sensible business models, it is important to maintain some eco-system among different stake holders.

The mobility service has the fundamental factor of invoking user mobility needs. It should be noted that this sustained mobility needs for core users is difficult to turn into revenue stream. The eco-system can be built in the following flow:

- put advantages to the mobility-leveraged core users and keep them as the center of the star-economy,
- create a hierarchical system in a game to put social advantages to the star users, and
- the star economy stimulates the lower-layer users in the hierarchical system to use money in the affiliate systems.

This eco-system needs the following conditions:

- The revenue flow in the affiliate system sustains,
- The hierarchical system will give the advantages to the core user who will invest their time and money
- The game needs non-zero sum factor to make use of the hierarchical system for sustained growth

V. DISCUSSION

The skewed business relation model in location-based games is depicted in 1. In order to lower the acceptance threshold, content providers provide free games. In the networked games, the end users pay the significant network fee for the network operators. In the advanced 3G era, a majority of end users use flat-rate tariff for data services. In this sense, there is no significant revenue growth for the network operators. In the location-based content, especially in the location-based games, it is crucial to make location changes in the physical world. It produces relatively noticeable revenue streams for the transportation business, however, it is difficult for the mobile content providers to share the revenue.

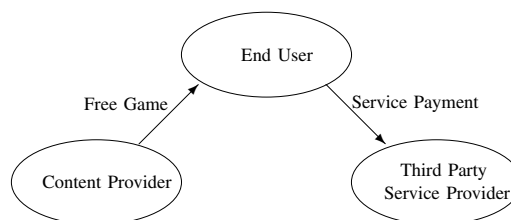


Fig. 1. The skewed business relation model in location-based games

TABLE I
REVENUE CATEGORY.

Category	Description
Full Revenue	The fee paid by the end users will go to the service provider company. The company owns the original rights on the digital goods.
Margin Revenue	The major part of cost born by the end users will go to the original goods/digital right owners. The service companies take a small portion of the cost as commission.
Dead Revenue	The major part of cost born by the end users will go to the independent companies different from the service provider.

In order to cope with this skew in the business model, the star-system can be leveraged to stimulate the ordinary end users' expense in the surrounding service environment using some indirect mechanisms like affiliate business.

The revenue category is illustrated in Table I. In the skewed business model, the content provides continue to generate the dead revenue stream.

In order to maintain the social community based on the location-based content, it is important to facilitate the hierarchical user structure in the network game context as illustrated in Fig. 2 .

In this hierarchical system, the star users exercise the real transportation, sometimes in a nation-wide level, and get their reputation as stars. In the second level, the local stars exercise some level of the real transportation with significant dedicated resource for the location-based games. In the bottom level, there are ordinary end users who will provide the respects for the stars and feel positive views on the game world. They provide the baseline supports for the game.

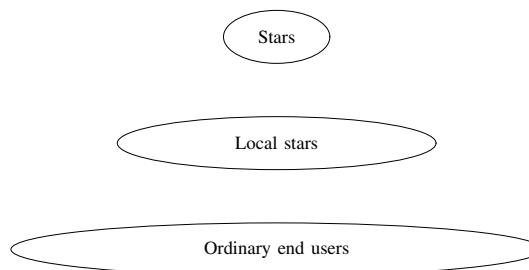


Fig. 2. An example of a hierarchical star system.

TABLE II
THREE-LAYER STRUCTURE.

User	Description
Core Users	Long-term commitment, creating the top level star values, spending time and money for maintaining top level star status.
Middle Users	Increasing commitment to the game, increasing energies to be used in the game.
Light Users	Light-weight users, sharing the game world view, paying attention and respects to core users, occasionally spending time and resource for the game.

This hierarchical system reflects a pseudo-society and creates a baseline social tie for the game community. The ordinary end users cannot exercise the extensive transportation like starts and local stars. They can purchase some of the items without exercising extensive transportation, however, the content providers should keep the priority to honor the real world transportation to maintain the star user's advantages.

The three-layer structure is depicted in Table II which corresponds to Fig. 2.

A. Convergence

The mobile Internet has the following directions:

- convergence to the Internet
- convergence to the real world integration

The location-based game fits the real world integration. The real world factor provides a new interest and enthusiasm for mobile game users.

The real world integration has a greater degree of fits for service platform. The location-based games provides not just for entertainment but also service platforms. Location leverages mobile community, segmented marketing and integration of virtual and real world integration.

From the early stage of the mobile Internet, the mobile services have pursued rich media experience. The device multimedia capability has been progressed over the last decade, which leads to the saturation. 94 % of Japanese mobile users use 3G high speed data rate. Approximately 50 % of users use data-flat-rate services, which means the data rate is flat disregarding their packet use. This provides some degree of maturity of rich media service. Wireless carriers and mobile service content providers are pursuing the non-rich media service exploration. The real world integration is one of the promising areas in align to this real world integration direction.

ties are important to harness real world integration. The social respect shown in the star system is important to leverage vertical social factors. The vertical social factor can utilize beyond real interpersonal interaction.

The multiple levels of social ties are depicted in Table III. The star system corresponds to the third level, one of indirect communications. The indirect communication is more suitable for scaling than direct communications, harnessing mobile community growth.

B. Revenue conversion

Many mobile location-based games pursue revenue generation starting from free games. The conversion patterns are

TABLE III
MULTIPLE LEVEL OF SOCIAL TIES.

Item	Type	Examples
Interpersonal communication	Direct communication	Message. Dialogues. Interactions.
Contribution	Indirect communication	Social acknowledge of Contributions.
Star system	Indirect communication	Social respects of Achievements.

TABLE IV
REVENUE STREAM CONVERSION PATTERNS.

Conversion	Description
Free → Free	Media services, portal services. Generates revenue with associated side user activities (affiliate marketing, advertisement, ...)
Free → Free/Fee hybrid	Adding premium service with payment. For example, adding item purchase to a free game.
Free → Fee	Turning free service into fee service.

depicted in Table IV.

Many location games are free-content. In order to provide a community-grown game, it is crucial to lower the entry barrier. Mobility is considered to be community-friendly factor. Many people favor communication on their travels. Mobility experience invokes communication demands.

Also, it is observed that 70 % of users are metropolitan business persons, significantly different from teen-agers free game download sites. This segment is promising for mobile commerce because buying power is superior in this segment.

The above mentioned revenue conversion patterns are important not only in mobile games but also many mobile services.

C. Comparison

The comparison of revenue stream is shown in Table V. The star user system will increase the content provider's free hand to control non-fee and non-advertisement revenues. Item sales are one of such additional revenue sources. The star-economy's social factor leverages the acceptance of such additional revenue sources as well as the free game expansion strategy persists.

The community-base has been considered to be an important asset for leveraging mobile games. In the past, the community is considered as horizontal community, without any hierarchical structure. The star system is based on the enthusiasm level and provides a base for the hierarchical structure. In this sense, it provides a vertical view on the mobile community. The heterogeneity of the structure brings a different level of social respects and game satisfaction. Each user can choose their position in the vertical community and pursues their interest and advantages of the game according to their use context.

This vertical structure is also generally applicable to the other game domains not restricted to the location-based games.

D. Limitations

This research is still at the early stage and limited to the qualitative description. The social impacts from the hierar-

TABLE V
REVENUE STREAM COMPARISON.

Content Fee	Secure the Revenue	Increase difficulty to gain new users
Advertisement	Free entry for new users	Difficult to maintain game world views. Challenges to secure advertisers.
Item Sales	Free entry for new users. Easy to maintain the game world views.	Difficult until passing the chasm. Unpredictable revenue source for minor content.

chical community-based will be an interesting research topic covering the following areas:

- Dynamism of Star-economy
- Business model engineering to make use of star-economy
- User cognitive model to form a star-economy in the skewed business model contexts

Location is an easy-to-understand artifact to form a community for end users. The location-empowered mobile content needs to facilitate the social factors from this artifact.

VI. CONCLUSION

Location is one of the unexplored and promising factors in the mobile content. It is easy to understand the location-based content will distinguish it as the mobile-specific content. Location is an easy-to-understand artifact for end users to be utilized in the mobile content.

The author analyzes the location-based mobile content emerged in the Japanese mobile business. The author summarizes the business model challenges that the revenue stream is skewed and death revenue is created. The author presents a view on the star-economy which is coined in the recent Japanese mobile content business engineering.

Mobility is communication-friendly. When a user moves, it accelerates communication motivation. Location-based games have friendliness with mobile community. Location games were born 5 years ago, and they have struggled for revenue generation. Turning free communities into revenue stream generation is a common challenge for many mobile services. The star system, balanced hierarchical structure, provides a new vertical perspective for mobile community incubation and exploration. This provides a new view for identifying mobile community and for coining mobile business models.

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