Content Game – the Challenge for Mobile Operators

Annukka Kiiski
Networking Laboratory, HUT
annukka.kiiski@hut.fi

Mikko Kiiski
Suomen 3 G ltd
mikko.kiiski@iki.fi

Abstract

This paper concentrates on modeling the relationships between parties in mobile content business. First the mobile content and content distribution channels are defined. After that the players of the content game are presented and evaluated by taking account some special issues concerning Finnish telecommunications markets. Some examples of revenue sharing in mobile content business are presented.

The last part of this paper describes the connection between content players so that the model could be applied into Mobile Business Game MOB developed in Helsinki University of Technology's (HUT) Networking Laboratory.

Keywords: *Mobile content, service operator, new services, content aggregator*

1 Introduction

New mobile services are emerging into the market and the role of the appropriate content is becoming very significant. Revenues of plain transmission services decrease and the value of mobile services is moving into the content markets.

The amount of players in the mobile content field has increased, but the interconnections between parties have not been defined clearly. To model mobile content business it's required to simplify the connections between players. A simple mobile content value chain is presented in Figure 1. The most significant questions in interdependencies between mobile content players include revenue sharing, charging structures, attractive service entities and interaction with the customers.

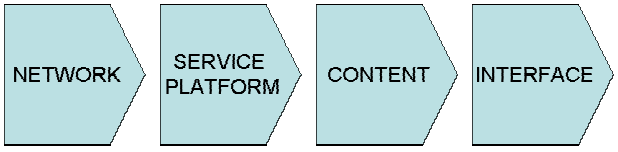

Figure 1 Mobile content value chain [1]

2 Mobile content

2.1 Content types

Physical content

Mobile terminal can be used for purchasing physical items or services when the payment is organized through the mobile network. These kind of small payments are usually called as micro-payments. Examples of micro-payments are parking fees paid with mobile phone and vending or store items purchased with help of mobile network. A real-life implementation of parking fee micro-payments is Park'It system in Finland implemented by Payway ltd which is a part of TeliaSonera group [2].

Digital content

Digital content means services to be delivered in digital form. Ring tones, operator logos and Enhanced Short Message Service (ESMS) messages were the first mobile digital services that were able to generate real income for mobile operators and service providers. Mobile information services like news, weather forecast and traffic notifications are possibilities to generate additional value for mobile users. The most fast growing area of mobile content is entertainment that contains different games and music services. Currently markets have high emphasis on infotainment services that are trying to gain high volume usage.

2.2 Channels to access mobile content

SMSC

The first mobile content was available through Short Message Service Centers (SMSC). Examples of services offered through SMSCs are operator logos, ring tones and Enhanced Short Message (ESM) pictures were implemented using SMSC features. Even today the most used services are implemented using SMSC [3].

SMS has very simplified and straightforward user interface where the message content is used as an input for the service. Pricing is based on the different categories of the short message numbers used for service

transactions or key words used in service commands. A typical transaction is originated by a customer who sends an action command into the predefined short message number and then receives the outcome of the command from the service. The messages send to mobile terminal can also be divided into different tariff classes so that the customer can be charged according to the outcome of the service request.

WAP gateway

Wireless Application Protocol (WAP) has not quite yet shown its full potential in mobile commerce. The usage of WAP gateway is based on the idea that the gateway monitors the service traffic. Service calls are then identified from the stream and in case of a successful transaction, charging items are produced and sent to the billing system.

A new area that might increase the usage of WAP gateway billing service is the Java MIDP (Mobile Information Device Profile) execution environment in terminal equipment. WAP gateway offers the most suitable chargeable way to get the software packages into mobile terminal.

Different kind of WAP Push services might also be able to create markets that would gain adequate amount of users to turn out to be profitable. WAP Push technology enables interactive messaging by offering messages with embedded identifier, hypertext references and action parameters.

MMSC

Multimedia Message Service (MMS) can be utilized for providing new mobile content types like images, games, software and music. The idea behind the MMS Center based content services is same as in SMSC case, but the advantage of MMS message is that one message can contain also the purchased content. MMS services can also benefit from the fact that the user interface is like in SMS service that customers are used to handle. From service operator's viewpoint, the pricing and charging of MMS messages is easy, because the earning logic is the same as in SMS messages (one price for one message).

MMS technology can also be used as bulk data container for some client side application services. By using MMS messages it would be possible to deliver data into mobile without any cost for customer e.g. in advertising purposes.[1]

[1] depending on pricing model use by mobile operator

2.3 Content pricing and charging

Pricing

Pricing of digital content is problematic because the price per product cannot be defined based on the production costs. The development of the first content product causes major part of the cost whereas the production of similar products is free or can be produced with low costs. Thus the development costs should be divided between all produced content products.

The price of content can be based on different issues – there is no explicit definition, what is the modest price for certain content. Physical items like books purchased via mobile Internet can be easily priced per product, but pricing immaterial information is more difficult.

Four possible pricing principles are introduced in *Content based pricing of Services in the Mobile Internet*, a paper by Kivisaari and Luukkainen [3]. According to the writers, pricing can be based on:

- customers willingness to pay (WPT) for a certain service [4]
- service differentiation to provide different quality levels
- content service bundling into attractive entities
- price discrimination: different price for different customers

Charging

Charging is always difficult in a digital multi-vendor environment where implicit trust between different parties does not exist. For example, the implementation of micro-payments is very challenging and requires a lot of bilateral agreements to work.

The major part of charging of mobile content services is based on the model where content provider and mobile service provider (described in the next chapter) have to have a mutual agreement that a certain service is offered for service operator's customers. When this agreement is made the user is able to access the content and the service operator takes care that the customer is charged. The service operator then pays for the content provider.

3 Players in mobile content game

The mobile content game is evolving towards generic Internet business model where the content providers offer their services directly or through content aggregator portal to customer. The role of service operator is focused into customer relationship management, network service broking and customer billing. Major part of mobile content is generated through subcontracting agreements.

The players in the mobile content game are of a truly different size: companies of all sizes, from one-man's enterprises to global alliances form different kinds of value chains to offer customers services they want to use. The actors of the mobile content business can be divided into four subgroups that are presented in the following subsections. It is also possible for one actor to operate in more than one sub areas, for example providing both the physical network and the network service.

3.1 Content providers

Content providers produce the information and services for mobile users. Some mobile content providers work in many different fields and mobile information is only one part of their product portfolio. Examples of these are Internet portal providers that also produce the mobile version with the same or almost the same content.

Today many companies act purely as mobile content providers [5, 6]. But at least as many offer also support functions to deliver the content or to maintain the mobile content portals [7]. Content providers can increase their share of revenue by offering exclusive content to certain customers.

3.2 Content aggregators

Content aggregators combine mobile information from various sources into entities that are attractive to mobile customers. Aggregator may purchase the information or develop the service joint venture with third parties [1]. Content aggregators work as an interface between content providers and customers so they are able to see customers' reactions in different things and maybe give some guidance for content providers.

A typical example of content aggregator is a specialized mobile portal or mobile operator's own portal service. Content aggregators try to attract more customers by composing interesting and entertaining entities for different user groups.

3.3 Service operators

The service operator (provider) ensures the communication between end-user and the service provider by offering accounts (logical connection and user information) for its customers. Service operators concentrate on customer account management and if chosen to participate in charging (instead of being just a bit-pipe), they have a significant role in micro-payment systems due to their customer billing system.

Service operator has also an important role to ensure that customer is able to gain access to the services that are considered as commodities. To create additional revenue service operators might offer different kind of service portals or service packages for the customers to gain more users and to ensure required amount of traffic.

Network operators

The role of a network operator is to offer the physical connection for user to access different mobile services and content. Network operator takes care that users are able to access certain content or service always when they are in PLMN (Public Land Mobile Network) area.

Network operators must also provide competitive service creation environment and technology to enable certain content services for network customers [2]. Location based information content is an example of content that requires quite sophisticated service platform.

An important functionality of a network operator is to provide roaming services for the customers when visiting a foreign network. Content services (specially bundled content) create challenges into roaming agreements.

3.4 Interconnection between mobile network operators

As can be seen in the previous subchapters, there are lots of connections between different players in mobile content game. Functionality of this co-operation has a major effect to the service experienced by the customer.

Content providers must have adequately users to be able to provide certain content with affordable price. This generally requires customers from more that one mobile network. This means that service operator must enable connections so that it's possible to access services from various networks. That access might be difficult to arrange or it might require a lot of effort like bilateral agreements in SMS based services.

Service operators might enhance their product by bundling content and mobile subscriptions into offerings for their customers. This is called vertical bundling and it's used to attract more customers to use mobile services. Thus the customer pays only one price for one service.

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[2] different types of operations models make exceptions to this, for example MVNO takes care of service platform

Revenue sharing between different players in mobile content business can be argued. To provide economically functional environment, contracts between different parties must be written for sharing the content sales revenue [3]. There does not exist any proven standard for revenue sharing but parties can freely negotiate percentages case-by-case.

Altogether, in a fractured market a strong interaction between different parties is important for the success of mobile content business. According to Takeshi Natsuno in his book *The i-mode Wireless Ecosystem* [8], the reason why mobile Internet hasn't taken off in Europe and US like in Japan is the lack of the general view of the total market and the ability to deploy the vision. Neither US nor Europe has had a telecommunications provider with the will to grow a new business and service based on a comprehensive view of the ecosystem as a whole.

4 Content game in Finland

Finnish content services are largely based on different SMS implementations. There exist a few big players in our content markets and then numerous amounts of smaller players. Majority of Finnish content providers sell content to service operators or other portal providers who provide the subcontracted content under their own brand (an example of such a portal operator is TV channel Nelonen that buys their content form Mobile Avenue Finland ltd [6]). Some content providers like mixMobile [7] offer pre-paid products.

At the moment all main content providers in Finland are providing multiple content types from ring tones to mobile games. The future trend in content business is however the segmentation of the market and concentration on one's core products [1].

4.1 Regulatory issues

Finnish Communication Regulatory Authority (Ficora) has a significant role in certain areas of the mobile content business. One example of this is classification of short message numbers that are divided into 4 different categories [9].

Ficora has also significant role to ensure fair competition between different operators and service providers particularly when we are dealing with the companies that have significant market share at the telecommunication market in Finland.

4.2 Adaptation of new services

About 30% of Finnish mobile customers use mobile content. Yet only 10% of SMS traffic in Finland is content, while 90% of messaging traffic is still used for person-to-person messaging.

Adaptation of mobile services is increasing very slowly due to the difficult user interfaces and usually half-finished service. The users are mainly early adaptors and there have been difficulties to get services into the stages where early majority starts the usage [10].

A good example of a physical mobile content pilot project in Finland is Payway's Park'It service [2] that is based on phone call and SMS based user interfaces. The service has reached a certain user group, but is lacking a real breakthrough. This service has just been developed to the next stage where mobile application client will handle the parameterizations of the service calls that have earlier been the biggest problem in service usage. It remains to be seen, how this new user interface affects the usage of the service.

5 Mobile operator game at HUT

For a mobile network service operator it is important to get the maximum revenue with relatively low costs. That can be achieved through increased amount of traffic in the network or through a certain share of content revenues. In both cases, a required amount of traffic has to be generated into network. The only way to do this is with the help of attractive content services.

In the Mobile Operator Business game MOB the content interface exists, but the functionalities have not been implemented yet. The purpose of this chapter is to clarify the decision parameters of the interface and sketch the models between different parameters.

5.1 Decision parameters

Operator billing

There are thus two main alternatives for the charging and billing the mobile content:

- service operator charges the customer and pays to the content provider
- service operator acts as a bit-pipe and content provider takes care of the charging and billing by itself

If the service operator decides to charge the customers for the content, there is a possibility to use a model where always a certain percentage of the service fee is to be paid to the operator by the content provider. Table 1

presents possible revenue sharing models used in Japan by NTT DoCoMo, used in Finland by TeliaSonera[3] and estimated in US by Cisco [11, 12, 13]. Participation in billing and charging for the content would require operators to invest in both research & development and purchasing.

Table 1 Revenue sharing examples

User activity	*Service Operator*	*Content provider*
NTT DoCoMo official services	9%	91%
TeliaSonera contact service	20% - 65%	80% - 35%
US: mp3 file	30%	70%
US: checking stock quates	50%	50%
US: purchase of hiking boots	9%	91%

A service operator acting as a bit-pipe doesn't take part in content pricing, charging or revenues but offers only the access for its customers to use any services provided by others. Nowadays the most probable strategy is to offer a mixture of preceding alternatives so that operator charges for certain content services like ring tones and enables access to the services charged by other means, too.

Operator's share of revenue

Taking a part of service revenues accessed through the operator channels may provide steady source of income, but requires large user base to be attractive for mobile content and service providers.

Another strategy would be to make comprehensive co-operation agreements with competent service providers and content aggregators. Instead of taking part of service revenues operator would concentrate on raising the service traffic into the level where the steady income would be reached simply by charging for traffic generated by the service calls.

Investment on partner relationships is required to be able to build credible service portfolio with adequate amount of different types content and services.

Operator's request for exclusiveness

If the service operator subcontracts a service portal, exclusive services can form a good source of revenue for the operator. Although a lot of resources is needed to maintain competent portal with exclusive services. The revenue streams from exclusive services are significantly higher than in other types of services.

5.2 Internal dependencies of decision parameters

The dependencies and relationships between content game phenomena are presented in Figure 3.

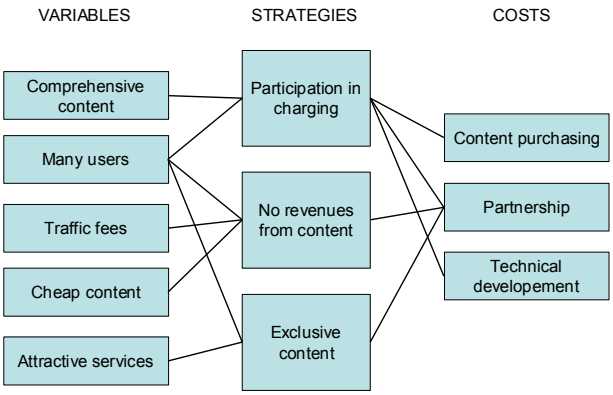

Figure 3 Relationships between content game modules

Operator charging and billing are required to enable major part of today's mobile services. The problem of participation in charging is that the system must be highly developed for that purpose (Purchasing: Billing and charging systems, R&D: Application and service platforms). The system requires also a lot of maintenance (Network maintenance: Billing and charging system) and bilateral agreements (Content: Investments on partner relationships) with content provider. A large user base (post paid and pre-paid) is required for a operator to be able successfully be a part of content charging. These same effects are valid when operators are taking a part of service revenues.

If the operator is charging only for the traffic transmitted trough the network, only the partnership costs (Content: Investments on partner relationships) are significant in content prospective. This model requires also a large

[3] As an example of Finnish content revenue sharing TeliaSonera's Mobile Contact Service. Percentages variation depends on the price of the content service: the more expensive the service, the smaller the revenue percentage paid for the operator.

amount of users and relative high general content competence level in markets.

The most challenging case for the operator is exclusive content market where right investments (Content: Investments on partner relationships) have a significant role. Also investments on production platforms (Purchasing: Billing and charging systems, R&D: Application and service platforms) are required to be able to offer competent exclusive services for the customers.

The game should track the competence level of operators' content services both in physical and digital contents. The operators' competence levels should be summarized to form market competence value. When the competence has reached the certain limit the user adaptations should follow the normal curve of service adaptation in technological markets.

6 Conclusions

It is clear that the significance of content offered through the mobile terminal is increasing. The variety of the content is expanding into so many areas that it is no more possible to offer or coordinate the content through one portal or gateway.

The role of the service operator is evolving towards the stage, where the operator is mediating the content from multiple sources to the customers that have subscription for content. Thus the role of content aggregator and service operator seems to be closing each other. Equally important seems to be organizing the collection of the content payments received from the customers.

Due to a wide variety of mobile content products it's required to have a deep knowledge to determine the quality of a certain product. This means that the acquisition of services is becoming so demanding that it's not practical to use service operator resource for that. Also the agreements with content providers must be made so that providers have a strong interest on developing their products and increasing the consumption of the products.

References

[1] Paavilainen, Jouni; Mobile Business Strategies: Understanding the technologies and opportunities; Addison Wesley, 2001; ISBN 0-201-78898-1

[2] Payway ltd; Park'It service descpription; URL: http://www.payway.fi/en_description.html (Referenced 10 November 2003)

[3] Kivisaari, Eino & Luukkanen, Sakari, Content-based Pricing of Services in the Mobile Internet, 2003

[4] Varian, Hal R., Pricing Information Goods, University of Michigan, 1995. URL, Pricing Information Goods, University of Michigan, 1995. URL: http://www.sims.berkeley.edu/~hal/Papers/price-info-goods.pdf (Referenced 3 November 2003)

[5] WES (Wireless Entertainment Services Finland Ltd.) homepages; URL: http://www.wes.fi (Referenced 5 November 2003)

[6] MAF (Mobile Avenue Finland Oy) homepages; URL: http://www.mobileavenue.fi (Referenced 5 November 2003)

[7] MixMobile ltd homepages URL: http://www.mixmobile.com (Referenced 5 November 2003)

[8] Natsuno, Takeshi: The i-mode Wireless Ecosystem, Wiley & Sons, 2003, ISBN 0-470-85908-3

[9] Finnish Communications Regulatory Authority (Ficora); Määräys Teleliikenteen estoluokista; Viestintävirasto 35 H/2003 M.; 6.6.2003; URL: http://www.ficora.fi/suomi/document/Viestintavirasto35H2003M.pdf (Referenced 9 November 2003)

[10] Kotler Philip: Marketing Management, Millenium Edition, Prentice Hall, 2000, ISBN 0-13-015684-1

[11] Grech, Sadro: i-mode pricing, 2003; URL: http://www.netlab.hut.fi/opetus/s38042/k03/topics/i-modepricing.pdf (Referenced 10 November 2003)

[12] TeliaSonera Mobile Contact Service, Pricelist for companies URL: http://www.sonera.fi/GetImages/GetImages_GetImage_pdf/0,1440,38754,00.pdf (Referenced 11 November 2003)

[13] Huang, Alan: Content Billing: The Next Phase of Data Services Pricing, Cisco Systems, 2003. URL: http://www.iec.org/events/2002/natlwireless_nov/featured/a3_huang.pdf (Referenced 11 November 2003)