Billing for Mobile Data: Technical Challenges

Analysis

Introduction

GPRS is currently being rolled out in Europe and in the US. So far we have not seen many mobile services for GPRS, but the demand for new business models and revenues streams will change this situation. I-mode in Japan is one proof of the mobile data services success, and the GSM association is developing а similar framework with WAP called M-services. The fixed Internet has relied on advertisements as main revenue stream, which has resulted in insufficient charging mechanisms preventing launch of many valuable services. Service offerings will be limited on the mobile Internet as well unless mobile operators know how to charge for the services and have efficient charging mechanisms to do this.

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Northstream offers strategies and intelligence to the wireless industry. We cover all aspects of wireless: R&D, technology and business planning, implementation and end user aspects. Northstream has assembled a multinational team with some of the world's best experts and analysts on wireless communication business and technology. Within Northstream you will find a dedicated research team, which follows and analyses the developments in the wireless industry.

In our work as strategic advisors, we work with several of the world's leading operators and system suppliers, e.g. Vodafone, AT&T Wireless Services, NTT DoCoMo, SmarTone, Sonera, Mitsubishi, Ericsson, Microsoft and Siemens.

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Issues on Billing Methodology

There are a number of issues that mobile operators offering mobile Internet services need to handle, especially regarding the billing methodology of these mobile Internet services.

- Mobile operators need to have a clear idea of how they should charge for data services. There are a number of alternatives, ranging from simple flat rate as for many broadband ISPs, to advanced combinations of volume based, time based, content based charging with various service subscription fees. These price models will most likely differ between countries and mobile operators depending on cultural differences, customer segments, business models and the capabilities of operators' billing solutions.
- New billing and payment processes have to be established and new price models have to be implemented in the mobile operators' billing environment. Mobile operators have invested vast amounts of money in billing infrastructure for voice services. Upgrading these solutions in order to handle data services is a big challenge. Existing billing solutions need to be integrated with mediation platforms, portal platforms, mobile payment solutions and more. Further on, real-time capability is an inevitable requirement in emerging billing solutions. Current billing solutions are not real time solutions, rather batch-based systems designed to handle large volumes of data. The transition from old batch-based billing solutions to more flexible real time solutions is a major challenge for the mobile operators.
- There is a lack of technical solutions enabling brokering of data services. Having services provided by third party content providers makes the mobile operators a broker for these services. Brokering needs solutions for billing, revenue sharing and service provisioning. It also requires clear rules and responsibilities with operation and maintenance and customer care.

Billing Mechanisms

Looking at the situation in Europe today, SMS-based services are becoming abundant. Norway perhaps shows the biggest success, where SMS is extremely popular -especially among young people. Users also purchase ringing tones and icons to their mobile phones over the air or via the fixed Internet. For most of these services, the mobile operator adds the charges to the phone bill. The mobile operator becomes the broker of these services for content providers such as Genie, Djuice, Inpoc and Goyada. The billing mechanisms behind these services are often based on *premium SMS*, where the user pays a premium price for ordering the service by sending an SMS to a premium number. Premium SMS, however, is only implemented in TeleNor's and a few other operators' networks today. The content providers need to establish agreements with the operators on pricing and revenue sharing. Support for this billing method has to be implemented in the operators billing environment and billing processes.

Other solutions exist in countries where premium SMS is not implemented. Users dial premium numbers and order the services using DTMF tones. The operators charge premium rates per minute for these calls. There are other alternative solutions, one where the third party service provider is paid directly. The user then has a separate subscription rather than paying on the phone bill, and orders the service by making a call or sending an SMS to the service provider.

The use of simple price models and reuse of established routines with premium numbers and premium SMS is an important success factor. This is an example where simplicity in billing is a key to success. However, even if premium SMS currently is highly successful in Norway, it has not been implemented and offered in many other countries. This highlights the fact that introduction of new billing methods is a difficult issue and also proves that billing might be a potential showstopper when mobile data services aspires to take off.

Quality of Service

One of the problems when providing electronic goods like mobile data services is assuring the quality of these goods. It is difficult to measure the quality of a downloaded file. Imagine an end user downloading a music file, which is incomplete or corrupt: The end-user will still be paying for the volume of the corrupt downloaded file and possibly also for the content depending on how the service delivery transaction is controlled in the network.. This kind of behaviour is impossible to overcome and the question is how people will accept and respond to this. There have been discussions about Quality of Service (QoS) as a parameter in pricing GPRS services, but it is questionable if this will be used.

The next questions in this area relate to who is responsible for the delivery: The content provider or the mobile operator. Clearly, both have a responsibility. The content provider is responsible for the quality of the content and the accuracy, monitoring the start and end of a service transaction. The mobile operator is responsible for continuity in the data sessions and the data transfer quality. The responsibility issue also relates to operation and maintenance of the services and to customer care. Who should the end-user call for a dispute?

How to collect chargeable data

An obvious issue when discussing billing solutions for mobile data services is the collection mechanism, i.e. how to collect chargeable data. There are alternative solutions for this. One solution is to collect the data in a mediation layer with a proxy that interprets the data going through the proxy. Typically, such products are based on layer 7 switches that "sniff" the traffic and interpret the upper layer protocols such as URL addresses. Typical providers of these solutions are billing mediation platform providers, which add this functionality to their current billing mediation solutions. Another alternative is to collect data at the service access point. In this case the service access platform needs to communicate with the billing environment of the mobile operator. There is a standardized API for this called PARLAY.

Looking at the mobile subscriptions, more than 50% are currently pre-paid. In order to provide mobile data services to pre-paid subscribers, real time integration of the service platforms and pre-paid billing solutions is a necessity. There are billing products on the market claimed to support real time, but the operators have been reluctant to use real time in the billing processes so far. The mediation layer becomes the strategic tool to handle the increasing demand for real time solutions. Mediation is also considered as the tool managing rapid changes in network elements and real time communication between network elements. The mediation device is no longer only a protocol adapter between network elements and the billing system, but rather a necessity to cope with the speed in technology development.

Obviously there are lots of problems with billing of data services that need to be resolved. But one should not forget that there are immense opportunities and technical solutions that will be available when the demand is large enough. I mode sets a good example, showing that the billing of mobile services can be successful. The services are valuable, the quality of the services is good and the users are willing to pay for them. A great deal of the I-mode success can be attributed to the overall control of the services provided by NTT DoCoMo. Clear rules have been set on how to integrate with content providers. There are clear

and simple pricing models for both end-users and content providers. The end users have a billing relation to NTT DoCoMo in which they have good trust. We are eager to see this kind of success in the rest of the world.

Contact:

Northstream has studied all aspects of **Billing for Mobile Data Services**. Please contact us if you would like to find out more about this or about our company and the services we provide.

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