

# The recipe for mobile broadband profitability

Mobile broadband is seldom visible in **quarterly reports**. But it is still possible to see some **clear trends**, and in less than three years mobile broadband has **proven itself** to be a viable business on its own merits.

## Basic prerequisites for profitability

- ▶ Efficient networks. The case studies assume a mobile broadband network based on technology capable of handling things like good coverage, quality of service, and dynamically mixing voice and data.
- ▶ Efficient organization and management. Operators have to know how to allocate resources and how to determine whether mobile broadband is profitable or not.
- ▶ Understanding capabilities of different technologies. Operators need to use that understanding when calculating cost.
- ▶ Handling P2P challenges in the right way. Let the system do the “thinking.”
- ▶ The right business model. Flat fees work and buckets work too, but we don’t know what is around the corner.

▶ **OPERATORS FROM** Austria, Australia, Japan and Scandinavia have reported relatively strong financial results in mobile broadband because of high subscriber growth in the range of 1 to 2 percent of the population per year.

In the article “Don’t worry – mobile broadband is profitable” (EBR # 2 2009), I put forth a business case for mobile broadband. These calculations predicted it would take more than four years get the cost per GB below EUR 1 (USD 1.49). It seems though that the prediction was not optimistic enough when looking at operators like eMobile in Japan, Hi3G in Scandinavia, Mobikom in Austria and Telstra in Australia, which are thriving after two to three years.

Over the past two to three years, Ericsson has compiled – with operators from around the world – close to 30 detailed case studies. The results have been encouraging and most cases show strikingly similar results in terms of profitability. After closer examination, the cases show two primary trends to watch:

- 1 The overall utilization of the network, and its close connection to profitability.
- 2 Keeping internal accounting principles in order when looking at cost per GB/MB. Network capabilities need to be taken into account if there is an allocation of cost between, for example, voice and broadband.

In the past, operators often allocated costs between product areas using a model based on traffic load. This worked well when the difference in the services’ traffic was limited. But things have changed dramatically with the introduction of HSPA. There are numerous pictures and graphs showing the “gap” between traffic and revenue. (see graph 1) But people must make correct assumptions about traffic relative to cost.

In some cases Ericsson studied, the internal cost structure was such that the transport unit was internally charging product owners (voice, mobile broadband, SMS, etc.) on a per MB basis. Shortly after launching mobile broadband, some opera-

tors noted two trends; broadband looked to be unprofitable, and the unit responsible for transport was rapidly growing and drastically improving margins. The next step was to realign the transfer pricing to better suit the new service mix.

However, there is a more subtle aspect that can easily be overlooked. In the current software release for HSPA, there is a difference in capacity (spectrum efficiency) of roughly 10 to 12 times when comparing the voice and HSPA bearer on a 5 MHz carrier. (see graph 2) This means a voice byte is about 12 times more costly than a mobile broadband byte. This relation will change as high-speed data evolves, and even more so if voice is moved over to packet networks.

If this cost uneven relation is not taken into account – and in most current studies it is not; the cost allocation is done on an equal basis – mobile broadband will be overloaded with cost by a factor of at least 10 times.

This does simplify things a bit since operators often use other key performance indicators, such as subscriber base, to allocate cost. This somewhat lessens the effect, of overestimating costs but still means there is a risk the operator is not pursuing the mobile broadband opportunity in the way it should.

## A CONCRETE EXAMPLE

Using averages from a group of operators, mobile broadband accounts for close to 80 percent of mobile network traffic, but only 15 percent of the subscriber base. The cost per subscriber differs significantly depending on allocation method.

In order to calculate correctly, we must identify the actual load mobile broadband represents on the capital invested. This we can do following three simple steps: (see graph 3 on next spread)

With mobile broadband representing 15 percent of subscribers and 80 percent of traffic, but each traffic unit costing 1/12 compared to voice, the “load factor” is 1.9. This gives a significantly lower cost per mobile broadband subscriber.

A sensitivity analysis might be interesting here. What if 50 percent of subscribers



use mobile broadband? How much traffic can they represent and remain less costly than voice subscribers? Doing the calculations, we see that somewhere around 92 percent of the traffic can be broadband in such a case.

This result is quite astonishing, and it illustrates it is natural to have an imbalance between mobile broadband and voice traffic. This is what HSPA was designed for.

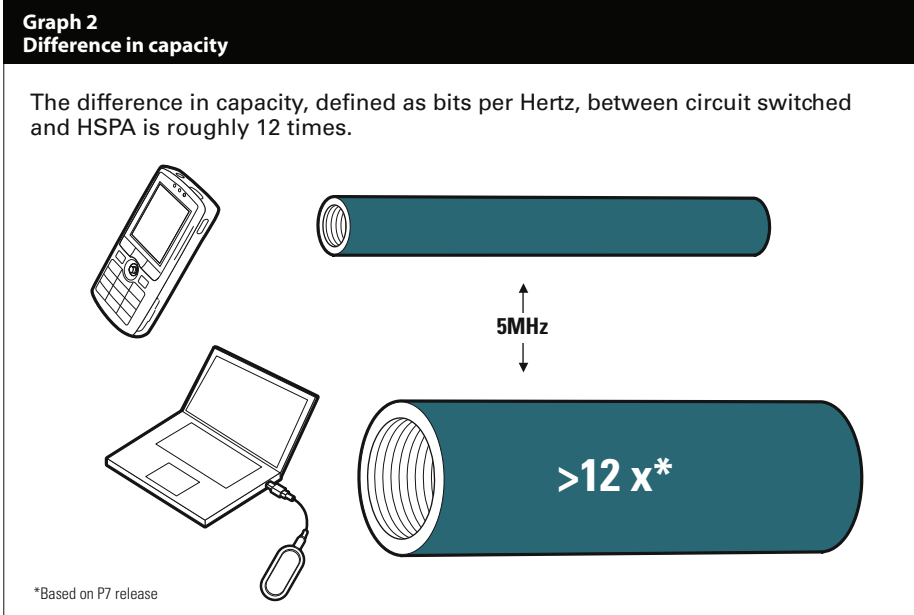
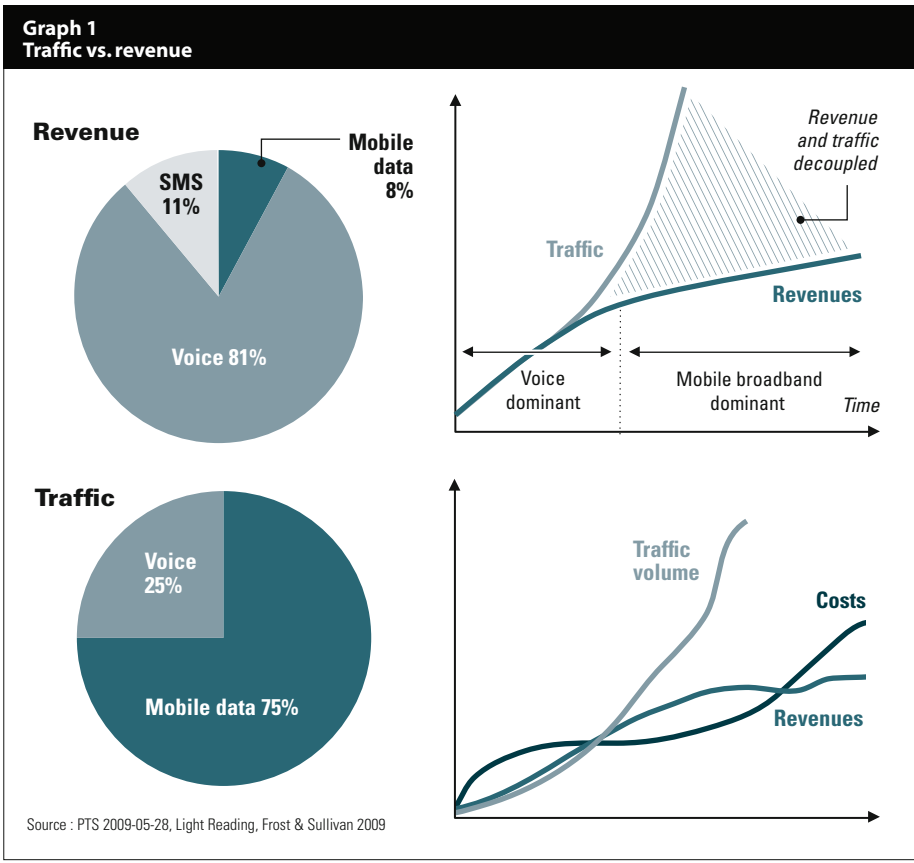
In this example, the network cost was assumed to be allocated to voice and mobile broadband. This is not entirely fair, at least in a case in which the 3G network already exists and was built out when mobile broadband was introduced. This brings us to a discussion about differing views of what can be considered "sunk cost." If we want to know how well our HSPA investment is doing, we must ensure we don't bring too many other costs into the equation. Would we allocate cost from the already existing 3G network if we were to launch a mobile TV service? Or if we decided to introduce Rich Communication based perhaps on IMS?

**ALL ABOUT NETWORK UTILIZATION**

A better way is to let each service carry its own costs first, and then distribute the common costs. Investments made to specifically enable mobile broadband, on top of the already existing network, should be allocated. Think of it as an investment in a whole new channel on the 5 MHz spectrum, which is 12 times more efficient to run data over than the circuit channel used for voice.

There is no single way of allocating costs, but it is important to strive for fairness between services, and minimize the risk of promoting unprofitable services or penalizing profitable ones.

We see the market effects of this when a service is priced too high to be competitive, though it may be in line with internal cost estimations. A less obvious situation may



**Graph 3**  
Weighing and allocating cost towards mobile broadband subscribers

**1** Calculate the relative load of mobile broadband subscribers vs voice subscribers

$$\text{Load factor} = \frac{\text{Mobile broadband traffic} / \text{Mobile broadband subscribers} / 12}{\text{Voice traffic} / \text{Voice subscribers}} = 1.9^*$$

**2** Calculate the percentage of the cost to be allocated towards mobile broadband subscribers

$$\text{Allocation factor} = \frac{\text{Mobile broadband subscribers} \times \text{Load factor}}{\text{Total amount of subscribers}} \quad \times 100\% = 28\% \text{ in this example}$$

**3** Allocate cost towards subscribers of each respective service type

$$\text{Cost per mobile broadband subscriber} = \frac{\text{Cost to be allocated} \times \text{Allocation factor} (28\%)}{\text{Mobile broadband subscribers}}$$

\*With mobile broadband at 80% of traffic and 15% of subscribers

**Built for broadband from start**



Atsushi Tanaka, CFO eMobile

► **“IF YOU** formulate a competitive business plan and steadily drive your business to achieve the plan, a PC-based subscriber business model will be profitable without a doubt. In fact, our company has already turned EBITDA into profitability.

“I think the notion that the PC-based business model should not be profitable has no ground at all. We have put our efforts from the start into developing an efficient and low cost network, expanding sales channels and building up customer support centers in line with our business plan.”

“As voice communication has shifted from fixed to mobile, the same shift will definitely come to the data communication. eMobile was established with the aim to promote services centered on mobile broadband communication. If you look at the potential scale of the market, the fixed network is for households whereas wireless is for individuals. We believe the scale of wireless is many fold.”

► be that the price is set at an attractive level, but the limitations placed on the end user are too strict, making the service less competitive. In the end, these things affect the take-up rate negatively, and since telecom is about economies of scale, it becomes somewhat of a self-fulfilling prophecy.

The simplest way to quickly reduce costs is to work toward rapid growth in subscriber numbers.

The operators mentioned above are some of the most successful in terms of subscriber uptake, and their utilization of the network makes it possible to be profitable. eMobile has virtually no other services with which to share costs, and its entire network is built around heavy traffic users – PC users.

The utilization levels in most HSPA networks are typically low compared to the overall radio network capacity, though networks still see heavy load in some areas. Any site built in big cities like London, Tokyo, Paris or New York is expected to carry heavy traffic. But these areas are also where operators typically generate the most revenue and profit per site. It is outside such areas that operators need to get subscriber numbers up and raise traffic.

**HANDLING OVERLOAD THREATS**

The way to effectively handle the traffic load may differ significantly from operator to operator. Even in markets where operators may have similar packaging and pricing, we see great differences in the average consumption per user and per month. In some markets we could see differences as big as a factor of five to 10 times. This is

true for both fixed and mobile broadband networks, and only shows it is dependent on how each operator positions themselves in the market.

There are two main drivers for high data consumption today: peer-to-peer file sharing and video streaming. Peer-to-peer file sharing has been dominant for some time although video streaming services are growing rapidly. Music and radio streaming also generate significant traffic, but on a per-user basis it can't measure up to file sharing and video streaming. There is one limitation with video streaming that differentiates it from peer-to-peer, despite its rapid growth and higher bitrates. It is hampered by the individual's time spent in front of the screen, while file sharing “work” is done by a computer that can download files throughout the day.

The operator needs to find a balance between addressing traffic issues that drive costs and limiting end users too much, which may impact uptake. To the end user, there is virtually no correlation between volume and value. To the operator, there is a correlation between volume (at busy hours) and cost. The mechanism an operator uses to handle the traffic needs to take this difference into account. By focusing on packages with different amounts of GB, the operator is putting a value on volume for the end user.

At the moment this is probably the most common method used to limit costs driving data consumption. This works fairly well in reducing the traffic per user, although operators with these limitations have higher average traffic per user than

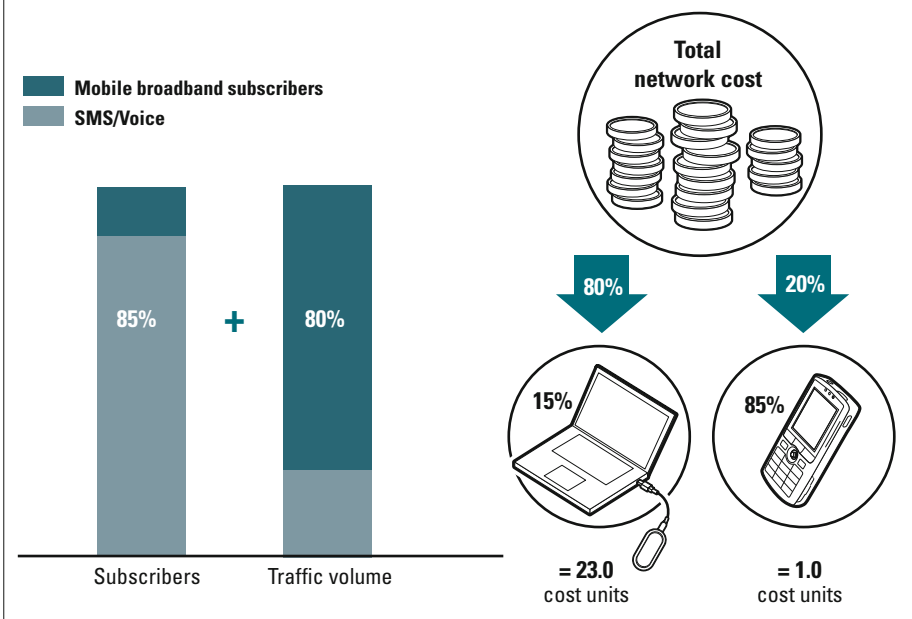
**On the fast track to profitability**

► **EMOBILE LAUNCHED** its service in Japan in March 2007, and is reporting positive earnings before interest, taxes, depreciation and amortization (EBITDA) month to month, and expects to be EBITDA positive in 2009. More than 90 percent of eMobile’s subscribers are PC users. The Scandinavian operator Hi3G reports its mobile broadband subscribers are expected to generate “higher percentage margins than its voice customers,” despite a lower ARPU for mobile broadband subscribers.

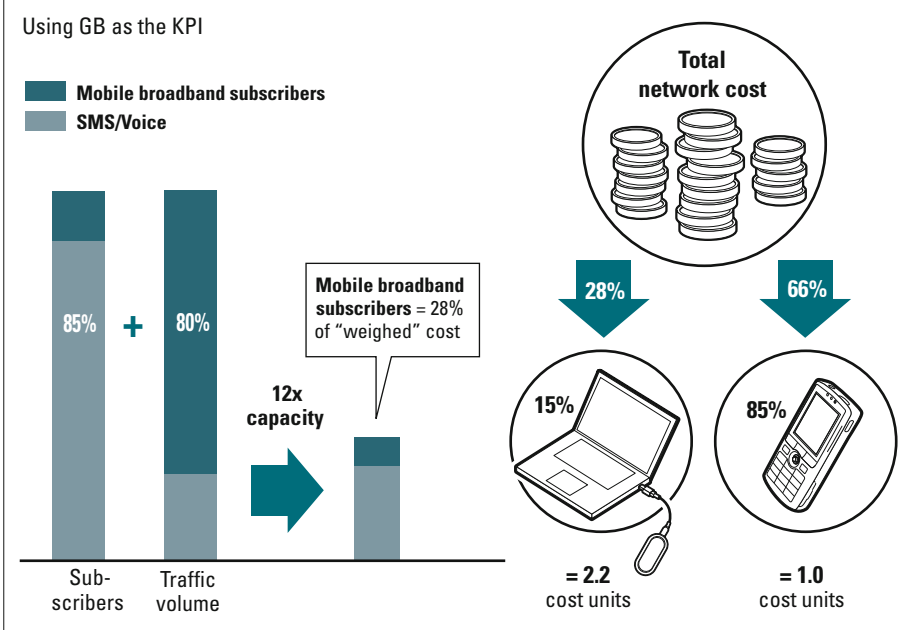
Mobilkom in Austria has managed to maintain its EBITDA and operating income levels, while showing strong growth in broadband and a dramatic decrease in contract churn levels. In terms of volume, Mobilkom’s mobile broadband-related revenue in Austria already surpasses that of their entire operations in Serbia and Lichtenstein.

Telstra in Australia reports similar trends with strongest growth coming from their wireless broadband service (+69 percent in revenue YoY), while increasing their company’s EBITDA.

**The “unfair” way of allocating cost**



**Allocating cost in a “fair” way**



operators without any limitations. This indicates it may be the operators’ position on the market, more than the packaging itself, that determines the usage pattern.

A bit more finesse is achieved when operators use their own network resources to handle problems when, where and if they arise. It is called “traffic handling priority,” and allows the network to lower the priority of traffic for certain users, for example, when the usage level reaches a certain limit. The “fair use level” set by the

operator is then the level at which the cost is “capped.” At the same time, each user is able to keep downloading data at the speed allowed by the system and their subscription. It is only when “normal” subscribers begin filling up a base station site and there is congestion that the operator is forced to consider upgrading or expanding the site. To the heavy user, the average degradation in speed will differ, but in most cases it is not severe enough to be noticed until the data from other users starts to fill

We are beginning to *see evidence* in operator reporting that mobile broadband is profitable, even in *the worst case* bit-pipe situation. We have looked at the importance of doing the internal cost-calculation exercises correctly, and have seen it is possible to put a “cap” on the cost per subscriber by using *intelligent functions* in the network.

► the pipe. Still, any traffic – peer-to-peer traffic in particular – can continue flowing outside the busiest times of the day.

#### BUSINESS MODELS THAT WORK

A pricing and packaging principle that allows end users to download as much as they can is the most attractive. To the end user, a surprise bill every month – which is what packaging with a price per MB generates – is the worst thing possible.

This poses a dilemma for the operator, since traffic is a cost-driver in the network, at least during the busiest hours. Over time operators must be able to raise prices to invest in the network and keep up with increasing demand. On a global level, monthly usage per individual is increasing by about 20 to 30 percent annually. This will force operators to expand their networks when there are no more new subscribers or subscriptions.

Bucket pricing may appear to solve the issues of traffic management and increased fees for users who consume more. In order to charge more, operators need a mechanism that – in the consumers’ eyes – makes a reasonable connection between consumption and price. But this is part of the problem that operators are facing; to the end user there is no clear correlation between volume and value.

On the other hand, speed has proven to be a reasonable way to communicate value to the consumer. It is also possible to relate speed to different application types. Speed also costs the operator, even more so than traffic volume. Speed or pipe size costs money in terms of investments, while bytes that flow through the pipe outside busy hours do not really cost.

The downside of traffic-handling priority is that it does not motivate a user to pay more, even if consumption increases. But that is only true in networks with a low load level, and then there is no real cost increase to the operator. The main purpose of traffic prioritization is that the operator will not be forced to upgrade to

cater to a small number of heavy users.

A downside of bucket pricing that is rarely considered is an expectation that the operator has to deliver on this volume offering. The market trend has been to offer larger buckets in the hunt for market share. If bucket sizes are increased without a change in price, then this method can prove to be more costly than one with no limit offers and intelligent management mechanisms.

We are beginning to see evidence in operator reporting that mobile broadband is profitable, even in the worst case bit-pipe situation. We have looked at the importance of doing the internal cost-calculation exercises correctly, and have seen it is possible to put a “cap” on the cost per subscriber by using intelligent functions in the network.

Going forward we must also consider the most complex area – which business models to use. Operators need to learn how to market mobile broadband in new ways, while maintaining strong current subscriber growth and securing sustainable and long-term revenue growth for the industry. ●

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