

# Smartphones as drivers of change in mobile broadband demand

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Mobile broadband market is growing at a high rate because of a number of contributing factors. This paper concentrates on the effects of end user device distribution on mobile broadband bandwidth demand.

Omnitele predicts that in the near future the next generation smartphones will start generating significantly more traffic in the mobile networks than today. Due to higher mobility of smartphone users, the generated traffic will be more difficult for operators to plan for than the present, mainly laptop originated wireless broadband traffic.

## Mobile broadband service has a high value proposition for end users

In a typical market, increase in mobile broadband bandwidth demand has been driven by traffic generated by laptops attached to a USB mobile broadband dongle. The popularity of the dongle-based access has been evident already in the early phases of the mobile broadband market. The nominal offered connection speed in those days may have been as low as 500 kbit/s. Clearly, users have found value in the on-demand wireless connection

even though the highest connection speeds, such as 7.2 Mbit/s using HSPA, might not have been achievable.

Based on Omnitele's experience, a trend as indicated in Figure 1 can be identified. That is, combined with the applications and usability of a modern laptop, an adequate connection speed is the only requirement for rapid service usage growth. Of course this also requires the price of the service to be not prohibitively high.



Figure 1 Laptop based mobile broadband use has increased network traffic significantly for operators.

Mobile market analysts Informa Telecoms/Ovum predict that smartphone shipments will significantly outpace those of modems. The latter are used to provide both embedded and external wireless connectivity options for

notebook and netbook devices (Figure 2). For the next five years, smartphones are globally forecasted to be shipping approximately triple the volumes of embedded and external modems combined.

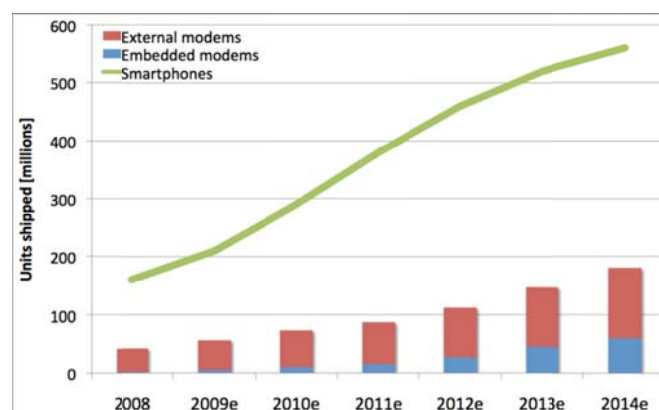


Figure 2 Smartphone shipments will eclipse laptop-embedded and external modem shipments. Sources: Informa Telecoms and Media 2009, Ovum 2009, Omnitele analysis.

## Smartphones will drive the next wave of mobile broadband growth

The combination of a laptop and mobile broadband connection has become an almost instant success creating massive amounts of mobile traffic in any market. The same has not yet happened for smartphones. Mobile traffic generated by smartphones has increased but, with the notable exception of the iPhone, at a much lower rate. However, we believe that significant changes are ahead for operators.

Two characteristics of the iPhone stand out for an average end user: the touch screen based input providing higher usability and the ability to run a wide variety of applications to make use of the higher usability. Without discounting other critical factors such as battery life and cost of

the handset, it seems that at the moment these two factors are driving increased handset usage as indicated in Figure 3.

When correctly implemented, these factors fundamentally affect the way in which average users interact and use their smartphones. Firstly, instead of menu structures, touch screen based interaction provides a more satisfying and natural way of interaction. Secondly, only now is an average user able to easily install and experiment with new applications. The ability to instantly access and interact with smartphone applications seems to create a self-reinforcing positive experience, prompting users to further investigate other possibilities.

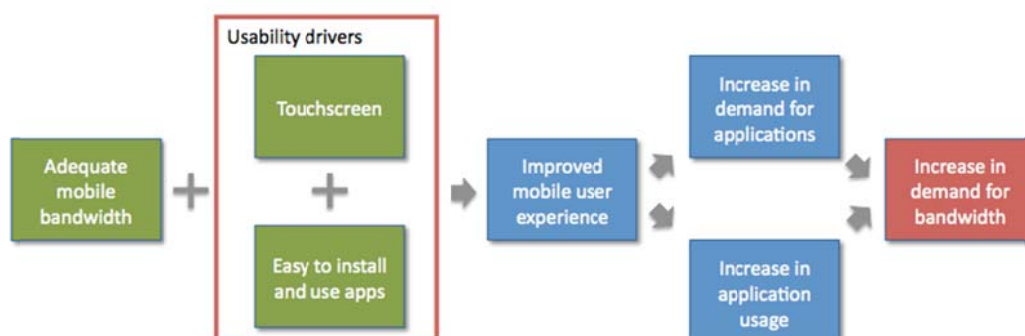


Figure 3 New smartphones with increased usability and ability to easily install and use applications with have significant effect on mobile broadband use.

## Largest smartphone players are only now getting up to speed

In markets where the iPhone has been available, the benefits offered by the enhanced user experience have become somewhat of a mixed blessing for operators. iPhones have been reported to generate, on average, ten times the traffic of other smartphones. Significant, sometimes massive increases in mobile broadband traffic have affected network loads dramatically and decreased service quality. It is

likely that the iPhone as a device and possibly also its typical users currently represent an extreme case in traffic generation. However, Omnitele strongly believes that when typical mainstream smartphones, such as Symbian based devices, start shipping with similar or better usability improvements, mobile broadband traffic generated by these new

devices will increase significantly, simply due to the size of the non-iPhone smartphone market.

Despite other manufacturers' increasing market share on high-end device segment, the smartphone market is still globally predominantly controlled by Symbian and RIM based devices as indicated in Figure 4. Neither of these vendors has yet introduced mainstream

smartphone devices with the usability characteristics required for high data usage. However, for example Nokia has announced that it is working on an improved version of the Symbian OS, Symbian^3, which is expected to be available during 2010 followed by Symbian^4 in 2011. Not surprisingly, the main focus areas of the new releases are touch screen based operations and improved usability.

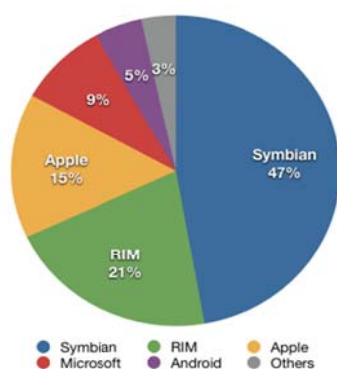


Figure 4 Global smartphones OS market share q4 2009. Source: Canalsy

In addition to end user device improvements, industry key players will launch new or enhanced mobile application stores in the near future. Examples of these efforts include Nokia's Ovi and Wholesale Applications Community

(WAC) by the leading mobile operators. Existing application stores from players such as Google and Apple will continue to expand and add applications.

## Smartphone based mobile broadband traffic will significantly impact operator networks and profitability

As a result of the developments described above, we estimate that several mobile broadband markets will start experiencing smartphone based traffic increase and traffic pattern changes in 2011. It may well be that the average smartphone will never reach the traffic levels of the average laptop-dongle combination. However, operators should carefully assess the potential impact of significant increase in smartphone based mobile broadband traffic. There are several factors that need to be considered:

- The distribution of mobile broadband devices within the coverage area will shift network load geographically. While an average mobile broadband user with a laptop is not very mobile in typical usage scenarios, smartphone users may be utilizing the handset under much more varied contexts.
- When in use, laptop users generate large amount of traffic in one cell; when not in use, laptops enter sleep mode where

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they cannot continue to transmit and receive traffic. Smartphones on the other hand are by their very nature more suited to running always-on mobile applications such as voice over IP, instant messages and updates based on user location. Such always-on applications generate large amount of low-volume traffic across the network.

- A typical laptop user may install new software only when connected to a fixed line due to larger application size. A smartphone user may download applications at her convenience due to social factors (a user may wish to install the same application as her friend when they are sitting together in a café), time of convenience (a user waiting for a train may browse the application store), and in general smaller application size.

These behaviors will have an impact on network traffic and traffic patterns. Some parts of the network will experience significant increase in

user and signaling traffic. This has to be managed to avoid end user quality degradation. Large volume of lower traffic generated by the smartphones may cause statistical usage patterns to form. Such statistical patterns, if they do exist, will allow network performance trend to be monitored and hence the network can be better prepared for growth.

The bright side of the above is that the operators have a great possibility to benefit from this development. Smartphone users are in any case likely to transfer only a fraction of the data of a typical dongle user, but may still purchase a sizable data packet with a monthly fee to avoid unpleasant surprises on their bill. If the operator prices this packet correctly, smartphone users may contribute significantly to the operator profit.

Operators need to proactively plan for the effects of changing terminal and traffic distribution on their mobile networks. Otherwise these changes in traffic volume and pattern may take them by surprise.

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## About Omnitele Ltd.

Omnitele Ltd. is a pioneer within the wireless industry with twenty years of leading edge network and business consulting experience worldwide. Omnitele was founded in 1988 to set up the first GSM operator in the world and is owned by Finnish national telecom operators and an external investor. Omnitele's strengths lie in mobile network planning and development, technical consulting and operator business development. We aim to increase and improve overall operator performance and quality of services, and we thrive to provide best solutions for deploying new technologies and frequencies.

Omnitele techno-economical strategy consultancy services are based on deep understanding of the four basic elements: realistic technology simulations, well-educated data traffic modelling, vendor pricing structure analysis and revenue estimations. Omnitele has a proven track record in assessing changes in traffic and optimizing mobile networks to cope with the changing demands.

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