


Internet set to reach the rural masses

Mobile networks can serve rural consumers for about a tenth of the cost of a fixed network. And if you have a business case for building GSM coverage, you can offer internet access at virtually no extra cost. This removes a great hurdle to bringing the internet to all.

 **WITH MORE THAN 80 PERCENT** of the mobile world market and about 90 percent market share in developing markets, GSM has turned out to be the technology for the masses. Most GSM networks have now been upgraded, allowing operators to offer users not only traditional voice services but also medium-speed internet access and other data services. The availability of data access paired with mobility will drive information and communications technology (ICT) development, and traditional as well as new data applications will have a mobile component for wider usage in the population.

GSM operators are rapidly rolling out cost-effective transmission and radio networks in suburban and rural areas. As an example, population coverage in India was expanded from 30 to 60 percent in 2006 alone. In March 2007, the winners of an auction for the rights to create and run networks in remote rural areas in India were announced. Around the world, such networks are often subsidized by a universal service fund (USF) paid for by taxes on existing telecoms services. Auctions are held, and the network operators that ask for the smallest subsidies win. They must then provide a certain number of public payphones, and sign up subscribers.

But something rather odd happened in India: in 38 of the 81 regions on offer, many mobile operators asked for no subsidies at all. India's biggest operator, Bharti Airtel, even offered to pay in 15 regions. As a result, barely a quarter of the INR 40 billion (USD 920 million) available in subsidies is likely to be allocated. If operators reckon there is money to be made running mobile networks in some of the poorest parts of the world, have USFs had their day? Well, not exactly. Although Indian operators are rejecting subsidies for network equipment, they will still benefit indirectly from the fund, because it is also used to subsidize the establishment of shared sites for mobile-phone base stations. Even so, India joins other countries, such as Nigeria and South Africa, where commercial mobile networks are rapidly expanding into areas previously considered uneconomical.

The advent of broadband-internet connections is also changing attitudes to USFs. Because broadband links can carry both voice and data, some countries are starting to subsidize broadband roll-out instead of just concentrating on phones. And with so much of its fund unspent, India's government is drafting proposals to subsidize the provision of broadband to every village.

Funds can also be used to provide high-speed access to schools, hospitals, and local councils, and entrepreneurs can establish self-sustaining private community centers. This model is already taking hold in Uganda, Mongolia, Burkina Faso and Malawi. For universal service funds and for telecoms in general, the trend is clear: phones first, broadband later.

From voice to data

Once GSM systems are in place, text messaging or SMS becomes available and can account for a significant part of the communication. In markets with low-cost SMS it is not unusual for the SMS volume to significantly outnumber voice calls. In the Philippines, where sending and receiving SMS within an operator's network was initially free, SMS today contributes to more than 30 percent of operator revenues.

Markets with high illiteracy and a multitude of local languages also have a high usage of SMS, primarily driven by the behavior of younger and more affluent consumer segments. It is important not to assume that advanced services are unsuited to emerging markets – leading-edge applications will almost certainly stimulate growth in such regions. While experience indicates that the bulk of revenues will come from basic voice services and peer-to-peer SMS, an attractive mix of value-added services can provide a significant additional revenue opportunity for operators. In particular, there is great interest in local data – news, community service information, prices, weather forecasts, and so on.

Another interesting example is BubbleTalk, a “click, talk, and send” short voice-messaging service (VSMS or voice-SMS) initially



offered by Malaysian operator DiGi. This “talk and listen” messaging alternative to the “type and read” service provided by SMS is much simpler to use than voice mail.

Similarly, Indian mobile operator Bharti Airtel’s Voice Portal on 646 service offers an interactive voice portal where customers can, for example, listen to sports news or download ringtones using voice commands. The portal logged more than 16 million minutes of use in its first 10 months of operation.

Easy to add data services

While many basic data communications applications can be realized over SMS, many institutions – such as health authorities, educational institutions, and government – will almost certainly need more bandwidth for mobile data. The relatively low investment cost of implementing GPRS and EDGE gives GSM operators a golden opportunity to offer subscribers mobile data services at a reasonable price.

Once GSM coverage is in place, it is easy to add a packet data

service to the traditional voice service. GPRS, which handles packet-switched data and the “always on” functionality, has been around for more than 10 years and has evolved into an almost mandatory part of a cellular network. The additional cost required for the operator to offer data services is small. It doesn’t necessarily require huge investments in a service network, or a state-of-the-art advanced billing system. The service can be set up in a simple and robust way, with flat-fee charging and focus on user friendliness. It doesn’t have to be more complicated than that.

Operators often have only a vague idea about the cost of transferring megabytes in a GSM network, which can result in consumers being overcharged. Few people are willing to spend several dollars for surfing the internet or using other kinds of mobile data services, especially when the price is per-downloaded data volume, something that they can’t control. This is certainly the main reason behind the relatively slow uptake of mobile data usage in the developed world.

In reality, an operator can offer data services over GSM for a



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small cost. How small depends on what quality of service it is guaranteeing. If only “best effort” kinds of services are offered, then the marginal cost of providing data is minimal. Voice traffic always has priority over data, and new, IP-based technology used in backhaul reduces the cost for data transmission, something perceived as a major obstacle in the past.

The result is that if an operator has a business case for building GSM coverage, then it can also offer internet access at next to no extra cost. No need for new sites, new spectrum or new terminals.

GSM the only viable choice today

The telecom industry is debating the pros and cons of HSPA versus WiMAX, and which of the technologies is best suited to meet the future demand for mobile broadband services. It is important not to mix this debate with the one about how to bridge the digital divide – how to let the general population in developing markets get access to the internet.

In Western Europe, people normally mean a downlink speed exceeding 500Kbps when they talk about broadband, often relating to a fixed-ADSL connection in the home. It is so easy to forget that, only a few years ago, many did not have any alternatives to dial-up connections over a normal telephone line, which at its best



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The secret recipe

The project MTN@ccess was launched in 2006 based on the belief that internet access was going to be the next wave of mobility. South Africa already had more than 20 million mobile subscribers but MTN didn't want to wait another 10 years to reach the same number of data subscribers, so the operator introduced a number of incentives to create demand.

The project is a test to see whether a

commercial model can be created by entrepreneurs to successfully run an internet cafe in a poorer community. Around that are several support infrastructures, such as financing and basic training. Then there's a portal where customers can get ready access to websites. If they're not familiar with the complexities of the internet, they can easily find what they need through the portal, which constantly tracks their behavior and tries to bring the right content to them.

A key aspect is the simplicity of the model to the consumer; if they spend 10 minutes on the internet, they understand exactly what it will cost them.

Another aspect is the simplicity of the model to the entrepreneur – that they fully understand it is a profitable business. There have been some very encouraging moves – some of the early entrepreneurs, for example, set up business near schools and those cafes did very well. The ones who stood back and waited for things to happen lost out.

This is the secret recipe – it is not what the operator does; they are just creating the fabric for an entrepreneur's success.



gave one tenth the speed of broadband. But for a majority of people in the developed world, this is still what they use to make their daily contact with the internet.

This situation is now changing quickly as the necessary factors come together to make deployment of mobile telephony based on GSM feasible. The biggest obstacle for this development has been the lack of availability of cheap telephones, but this has recently been addressed by the industry initiatives to develop ultra-low-end GSM terminals, and there are also quite a lot of secondhand terminals flooding the market.

GSM equipment prices have fallen drastically over the past few years. Scale advantages, in combination with new mobile network features, have reduced the total cost of ownership for service providers, and this evolution has made mobile services affordable to the low-income segment. Suddenly, deployment cost is not the biggest issue.

In developing markets it is important to lower entry barriers for usage and offer services that improve quality of life. Because of the high cost of mobile phones, users commonly share phones. This sharing is often an ad hoc arrangement, with subscribers renting their phone for a call. In addition, operators are providing special community information centers.

GSM operators also have the opportunity to be the first mover in offering "internet services for all," holding a time-to-market advantage over any competing technology.

By equipping community center PCs with data cards or embedded data modules, which today normally support EDGE as well as HSPA, operators can provide cost-effective access to data services for everyone now as well as in the near future when bandwidth requirements increase and 3G licenses are released.

HSPA can be introduced either into the entire network, as Telstra has done in Australia, or gradually, as MTN has done in South Africa with its MTN@ccess program. The MTN model, in particular, allows for data and voice to be carried over the GSM network when the subscriber is outside HSPA coverage. This approach enables the smooth, cost-effective introduction of HSPA.

True mobile broadband services over EDGE

When it comes to high bandwidth, the question that remains is does one need HSPA or WiMAX? Only the consumer can answer that. But for many markets, where people might spend hours getting water, food or traveling to work, it is hard to see a strong demand for high-speed data, mobility, roaming or other features that those in the Western world take for granted. Just the ability



Coming to a village near you

Access to internet-based services is now readily available to people living in rural areas of Bangladesh. Grameenphone, the country's largest phone company, has set up community information centers (CIC) in rural areas to make shared voice, internet, and data services available to those at the bottom of the economic pyramid. Some of the services now at their fingertips include video-conferencing with relatives, and

access to a wide range of information on such things as health, job opportunities, market prices for agricultural produce, and government services.

Piloted in February 2006, the CICs provide access to the internet and other information-based services through Grameenphone's nationwide EDGE connectivity. The CICs are located in rural areas, where the nearest point of access to the internet is about 20-30km away.

There are more than 500 CICs in operation around the country. Each center serves a community of about 40,000 people.

The CICs are franchised, independent businesses run by a local entrepreneur. Each center is equipped, at the least, with a computer, printer, scanner, webcam, and EDGE modem to connect to the internet. With expected revenue of USD 6-7 per day, and costing around USD 1000 to establish, the centers are financially viable in about a year.

An affiliate of Telenor AS of Norway, Grameenphone had more than 11 million mobile phone subscribers as of January 2007. In cooperation with Grameen Bank, the Nobel-Peace-prize-winning micro-credit pioneer, Grameenphone earlier introduced the internationally acclaimed Village Phone Program, providing universal access to people in rural areas who normally could not afford to buy a regular subscription. It also enabled poor village women to earn a living by selling mobile phone services in their area.

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to connect to the internet and run relatively simple applications for banking, trading or entertainment is a big leap in technology usage for many people in these markets.

Most of the networks built during this century can easily handle EDGE data speeds. EDGE currently enables peak data rates of almost 300kbps, and average data rates of around 120-160kbps. With this bandwidth, almost all types of data applications available on mobile phones work well, and PC service is also feasible.

EDGE data performance will be improved even more as EDGE Evolution is introduced in coming years. With EDGE Evolution, which is enabled by a software upgrade, bit rates can reach up to 1Mbps and true mobile broadband performance can be offered over GSM.

Whatever strategy is used to address the broadband market, GSM with its evolution path to HSPA and beyond has a clear advantage over to any alternative.

Most of the investments, whether in the backbone or access

networks, can be reused when new capabilities are introduced. GSM- and HSPA-originated traffic can use the same core network. Transmission networks can be reused and scaled to fit higher bandwidth requirements. Sites, in the core as well as the radio network, can be reused and new access technology can be introduced in parallel with what already exists. Even handsets and separate data modules, embedded in PCs as well as in data cards, will support multiple technologies.

Provided the spectrum is available, the decision to evolve the network with new capabilities will be less a technical issue than a business issue. It will allow for gradual investments, ensuring profitability for the service provider while providing affordable services for all. ■



Fast-moving China adopts EDGE

In addition to covering remote areas of Africa, the definition of developing markets can also cover an emerging global economy such as China. Hundreds of millions of people in China live in rural areas and have not seen much of the country's economic gains.

As part of its social responsibility policy, leading mobile operator China Mobile – with a nationwide GSM network serving 300 million subscribers – actively targets citizens living in rural areas, not necessarily with a profitable business case in mind.

In Guangdong, the major province in southern China, China Mobile runs a successful EDGE data network serving half a million people. With attractive flat-rate data packages, sometimes bundled with voice services, and a generously dimensioned network, it handles millions of gigabytes of data every hour.

The desire for mobile internet is extremely strong in these markets; it is opening a whole world of opportunities and making people feel part of the all-communicating world.