



The mother of invention

Network operators in the poor world are cutting costs and increasing access in innovative ways

PROVIDING mobile services in a developing country is very different from doing the same thing in the developed world. For a start, there may not be a reliable electrical grid, or indeed any grid at all, to power the network's base stations, which may therefore need to run on diesel for some or all of the time. That in turn means they must be regularly resupplied with fuel, which can be tricky in remote areas. Then there is the challenge of running the network profitably. In Europe mobile subscribers typically spend about \$36 a month, a figure known in the industry as the average revenue per user (ARPU). In America that figure is \$51 and in Japan \$57. But in China it is only around \$10, in India less than \$7 (see table 5, next page) and in some African countries even lower. As mobile phones get cheaper and more poor people can afford them, ARPUs across the developing world are falling.

Operators in poor countries have responded by finding new ways to reduce the cost of operating mobile networks and serving customers. The country that has gone furthest down this road is India, so

the result is sometimes known as the "Indian model", even though some of its features originated elsewhere, and some low-cost innovations developed elsewhere have not caught on in India. Despite an ARPU of only \$6.50 and call charges of \$0.02 per minute, Indian operators have operating margins of around 40%, comparable with leading Western operators, according to a study by Capgemini, a consultancy. "On low-cost, innovative models, this is where the centre of gravity is," says Prashant Gokarn, head of strategy at Reliance Communications, India's second-biggest operator. Given India's size, its combination of poverty and rapid growth and its reputation as a centre of technology and outsourcing, it is hardly surprising that it has emerged as the crucible of business-model innovation.

Indian model

Outsourcing is at the heart of the Indian model, which was pioneered and is now embodied by Bharti Airtel, India's biggest mobile operator. All of Bharti's information-technology (IT) operations are out-

sourced to IBM; the running of its mobile network is handled by Ericsson and Nokia Siemens Networks (NSN); and customer care is outsourced to IBM and a group of Indian firms. This passes much of the risk of coping with a rapidly growing subscriber base to other parties and leaves Bharti to concentrate on marketing and strategy. Unusually, it is not just the operation of Bharti's network that is outsourced but the construction as well, under a scheme known as "managed capacity" that is now used by several Indian operators.

When moving into a new area, Bharti requests a certain amount of calling capacity and pays for it three months later at an agreed price per unit of capacity, says Kunal Bajaj of BDA, a telecoms consultancy. That leaves it up to the vendor to handle the business of designing networks, putting up base stations and so on, giving it an incentive to build the network as frugally as possible. Margaret Rice-Jones of Aircom, a network-planning consultancy, says this cut costs by ensuring that operators do not pay for more capacity than they really need. "The old model was a bit like letting ▶▶



► your supermarket plan your shopping list," she says. The vendors, for their part, gain economies of scale because they build, run and support networks for several Indian operators. Ericsson's Mr Svanberg says his firm can run a network with 25% fewer staff than an operator would need. Bharti's operating expenses are around 15% lower than they would be if it were to build and run its network itself, and its IT costs are around 30% lower, according to Capgemini.

Arguably, the Indian model should be called the Ericsson model, says Mr Svanberg, because his firm developed it and first deployed it on a small scale in New Zealand. But, says Mr Bajaj, "Bharti decided to do its entire network like this, and to experiment at that scale is totally different." There were growing pains to start with as Bharti and its outsourced suppliers searched for the right balance of cost- and risk-sharing. Expanding into rural areas is especially tricky because the capacity needed is initially very low, so Bharti typically agrees to buy a minimum amount.

Equipment vendors make most of their profits when capacity is increased. "You make the land grab in the early phases, and what you're securing is margins and revenues for the future," says Ms Rice-Jones. The outsourced-network model is now gaining popularity with other operators in India. Even if they do not go as far as Bharti, they are more likely than operators elsewhere to outsource network design, tuning and management, says Mr Svanberg.

A second plank of the Indian model is infrastructure-sharing, in which several operators share the metal towers on which network antennae are mounted and which house their associated equipment, generators and so forth. In 2007 three Indian operators, Bharti, Vodafone Essar and Idea Cellular, pooled 100,000 of their towers in a single company, Indus Towers. Not all the operators use all the towers (the average is about 15 operators per tower), but the arrangement saves the three companies having to find new sites and build their own towers. Indus Towers will also lease tower capacity to other operators.

Similarly, Reliance Communications has spun off its towers into a separate unit that will offer tower capacity to other operators. This turns an operator's assets into a source of new revenue, says Mr Gokarn, and allows the mobile operator to concentrate on serving customers. Tower-sharing happens in other countries too, including Britain and America, says Greg Jacobsen of Capgemini; and some countries, including

It all adds up

Average revenue per mobile-phone user per month 2008, \$

Japan	56.9	Nigeria	12.7
France	54.2	China	10.1
United States	50.7	Kenya	9.8
Britain	37.3	India	6.5
Germany	30.5	Indonesia	4.8
Brazil	14.6	Bangladesh	3.7

Source: TeleGeography

China and Bangladesh, have made sharing compulsory. What is unusual about India is the extent of voluntary, market-led sharing as a way to reduce costs.

Other components of the Indian model include "lifetime" prepaid schemes, in which customers pay a one-off fee and can then receive incoming calls indefinitely, even if they do not make outgoing calls; widespread use of paperless top-ups, to reduce the costs of distributing top-up vouchers; and automatically turning off some equipment at night, when traffic volumes fall, to reduce energy usage.

The search for new cost savings continues. Reliance is experimenting with a "micro-call-centre" model, in which large call centres in urban areas are replaced by a smaller number of centres in more rural areas. This means agents can be paid less and are more likely to be able to answer queries. Turnover is high, so the trick, says Mr Gokarn, is to reduce the cost of training new agents. Indian operators are also keen adopters of "green" base-station technologies, such as air cooling, solar and wind power, and hybrid diesel-electric generators, which reduce energy consumption and hence operating costs. "Green technology has become a hot topic in India because it's cheaper," says Mr Bajaj.

Dynamic Africa

African operators, which face many of the same difficulties as those in India, have devised some cost-lowering innovations of their own, such as dynamic tariffing, pioneered by MTN. This involves adjusting the cost of calls every hour, in each network cell, depending on the level of usage. Customers can check the discount they are getting on their handsets. At 4am it can be as high as 99%. This generates calls when the network would otherwise be little used, says Themba Khumalo of MTN Uganda. In addition to the peak hour from 8am, he says, there is now a new peak hour from 1am as people take advantage of cheaper calls. Customers in developing

countries are far more price-sensitive than people in the rich world, notes Stephan Beckert of TeleGeography, so they are prepared to stay up late to save money. Vodacom has introduced a similar scheme. In Tanzania, says Ms Rice-Jones, it found that call volumes increase by 20-30% in areas where dynamic tariffing is switched on.

Another African innovation is "borderless roaming", introduced by Celtel (now Zain) in late 2006. This allows customers in Kenya, Tanzania and Uganda to move between these countries without paying roaming charges to make or receive calls. They can also top up their calling credit in any of these countries. The scheme has been extended to other African countries where Celtel operates, and rival operators such as MTN have introduced similar offers. Borderless roaming is possible because many operators have direct fibre-optic connections between their networks in different countries, allowing them to act, in effect, like a single network.

Alessio Ascari, of McKinsey, a consultancy, argues that Africa, rather than India, "is the new battlefield and the new laboratory for development" in telecoms. The difficulties operators face are even greater than in India, given the huge diversity and political instability in many countries, as well as widespread poverty and fierce competition. Africa is also interesting because local operators and regional champions are competing with Middle Eastern operators, such as Zain and Etisalat, and those from Europe, such as Vodafone and Orange. All of them, Mr Ascari points out, "bring different strengths to the market".

The wealth of innovation in India and Africa demonstrates that the Western operators are not always best at running networks. "Each of us is learning different pieces of the puzzle from the others," says Mr Álvarez-Pallete of Spain's Telefónica. His company is transferring expertise, and indeed managers, between its operations in Europe and Latin America. Much the same is done at Vodafone, which has separate divisions for the developed and the developing world. Vittorio Colao, its chief executive, says his company is applying its European expertise in customer-profiling and segmentation in India, for example, as customer loyalty becomes more important. But there is also a flow of expertise in the opposite direction, in particular in network operations. "There are a lot of operational ideas from a cash-constrained, poor and very entrepreneurial environment that you can immediately bring back to the developed world," he notes. ►►



► Perhaps the most striking example is the agreement struck between Vodafone and Telefónica in March 2009 to share towers and other network infrastructure in four European countries. Network-sharing is not new, says Mr Colao, “but the confidence to do it at scale, and with a fierce competitor, came from India. Once you see how it works in that kind of environment, you become much more confident that you can do it in Barcelona or Venice.” The savings are much bigger in Europe because the cost of leasing tower sites is higher, which adds to the attraction of the deal. An agreement reached in July by Sprint, an American operator, to outsource the day-to-day running of its network to Ericsson can also be seen as an example of the spread of the Indian model, argues Capgemini’s Mr Jacobsen. Ericsson is betting that it will be able to sign similar deals with other American operators in order to gain economies of scale.

Vodafone has outsourced more of its IT, again inspired by the Indian example, and it is using the Indian “managed capacity” model at one of its rapidly growing subsidiaries in Turkey. But according to Mr Colao this model, which he likens to leasing rather than buying a car, does not work everywhere. “In markets where you are not sure about speed and shape of growth, the model makes sense,” he says. But in mature markets where demand is easier to predict it can be better for operators to build new capacity themselves. Vodafone is also taking a leaf out of the Indian marketing book, moving its marketing chief from India, Harit Nagpal, into a global marketing role. (Google “Zoo zoo” to see Vodafone’s popular series of Indian television advertisements.)

The challenge now is to apply all these cost-saving lessons to connecting the world’s remaining 3 billion people and achieving universal mobile coverage. Within India, even the most remote areas are now judged to be on the verge of commercial viability, judging by the results of two auctions held in 2007. In each case bidders had to say how much government subsidy they would require to expand into rural areas, with the contract going to the lowest bidder.

In the first auction, for the right to build shared towers in 8,000 rural locations, the average subsidy requested was 35%, much less than expected. In the second auction, for the right to offer mobile services, many operators submitted zero bids or even negative ones—in effect offering to pay for the right to set up in rural areas. “The subsidies

required are not as big as everyone thought, because the companies believe there’s a business case in being present in rural areas first,” says Mr Bajaj. In part this reflects the cut-throat competition in the Indian market. But it also shows that mandated tower-sharing can make the economics far more attractive for operators in rural areas, which could be a valuable lesson for other countries. A second round of rural expansion, with another 12,000 shared towers, has been announced.

In China tower-sharing is mandatory, which has helped reduce the cost of expanding into rural areas. But since the three mobile operators are state-owned, the extension of coverage is co-ordinated from the centre. China Mobile, the largest operator, has signed an agreement with the agriculture ministry to cover 98% of rural areas by 2012, in part to compensate for its relative weakness in third-generation (3G) networks, where it is being forced to adopt the home-grown and relatively immature Chinese standard. And just as India, renowned for its technology-services industry, has pioneered clever business models and outsourcing to get prices down and extend access, China has used its own particular strength as a low-cost manufacturer (see next article).

Rural access elsewhere in the developing world is also likely to improve. One hopeful sign is the merger being negotiated between Bharti and MTN, which should accelerate the transfer of low-cost operating expertise between India and Af-

rica. Greater scale will also increase the combined firm’s clout with suppliers. The deal is driven by Bharti’s and MTN’s desire for long-term growth potential outside their existing markets, rather than by hopes of cost savings, says Mr Bajaj. But it could promote greater use of network outsourcing in Africa, and new techniques such as dynamic tariffing in India.

Spreading the word

This is unlikely to be the end of Indian operators’ international ambitions, which could spread the Indian model to other parts of the world. So far moves into Africa by Middle Eastern operators have not been conspicuously successful. Nick Jotischky of Informa Telecoms & Media, a consultancy, notes that Middle Eastern operators often lack the Indian operators’ experience with low-cost business models. Zain, for example, was said to be looking for a buyer for its operations in sub-Saharan Africa, many of which are making losses, to concentrate on wealthier customers in North Africa and the Middle East. But in recent weeks it has been negotiating to sell a 46% stake to a consortium of Indian and Malaysian buyers. Reliance, India’s number two, held merger talks with MTN last year.

In recent years Indian firms have made a series of bold foreign acquisitions in industries such as steel and cars. If its telecoms giants follow suit, their low-cost model could give them a clear competitive advantage—and help bring mobile phones within reach of even more people. ■



Dialling low-cost innovation