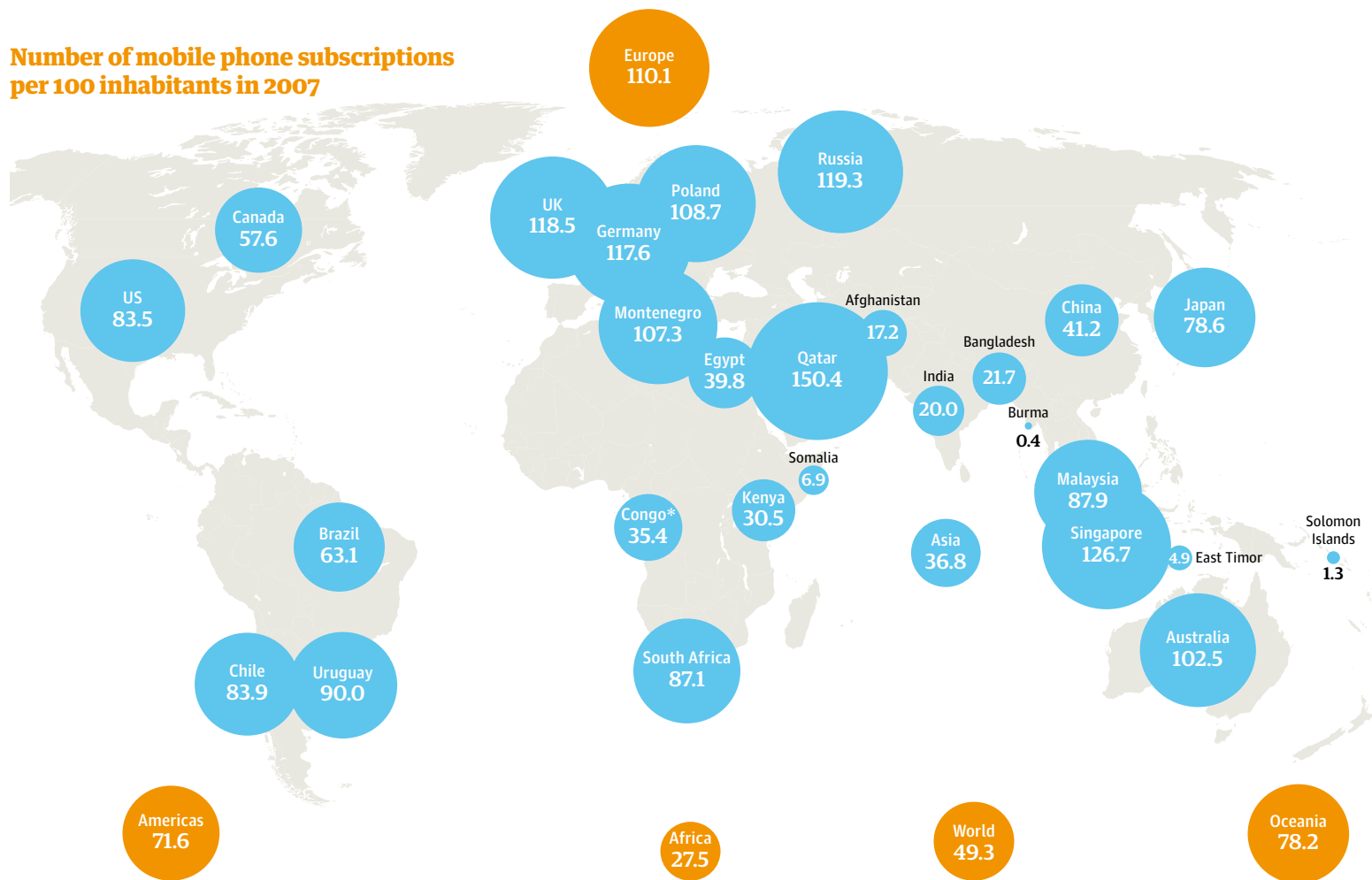


Switching on

Connecting the world

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Number of mobile phone subscriptions per 100 inhabitants in 2007



*Congo Brazzaville

SOURCE: INTERNATIONAL TELECOMMUNICATION UNION - BDT

Developing nations leapfrog West as mobile phone users explore the limits

Corruption is bypassed, elections checked and poor farmers informed

Charles Arthur

In the wake of the devastating cyclone in Burma this month, aid workers faced many problems – among them, communications. Even when they could get out into remote areas worst hit by the 190km/h winds, how could they stay in touch with people at the centre?

The most common solution was mobile phones. Diane Coyle, the author of a paper on the role of mobiles in

disasters for Enlightenment Economics, a consultancy specialising in the effect of technology and globalisation, explains: “In the immediate aftermath of a disaster, the contribution of mobiles is substantial, thanks to the speed with which cellular networks can generally recover from damage, usually within hours or at most a few days. It is typically much easier to repair a wireless base station than hundreds of fixed-line connections.

“This was demonstrated in the speed with which mobile services to customers were restored in the Gulf region of the United States after Hurricane Katrina. New mobile networks can be set up relatively quickly in places where there was either no net-

work to begin with or the original network was damaged.”

Burma, however, faces a challenge that many developing countries do not. Every day, about 50,000 people in Africa get a mobile phone – contributing to the rise in usage that in many countries in the developing world is growing at 100% each year. Burma, however, has the lowest penetration of mobile phones in the world, at 0.42%.

Across much of the developing world, however, the growth in telecommunications is having a profound effect on societies that, until recently, faced the common problem of developing countries: poor infrastructure. A mobile phone can't pave a dirt road,

but it can help you decide whether you need to travel down it in the first place.

The rapid expansion in the use both of mobile phones and the internet is also helping developing countries to leapfrog industrialised countries in the adoption and use of newer mobile technologies. Take the case of mobile banking. In developed countries, such as the US and UK, it represents a tiny fraction of usage; people don't quite trust their phones to be their conduit to their bank account. Only in Japan is it significant.

By contrast in the Philippines more than 4 million people use their mobile phones as virtual wallets – enabling them to buy goods

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Switching on

Technology must be available to all, says ITU

UN telecoms agency says the disabled 10% of world's population cannot be left out

Guy Clapperton

With a tenth of the world's suffering some form of disability, the International Telecommunications Union has declared accessibility to be the theme of this year's World Telecommunication and Information Society Day.

The union's secretary-general, Hamadoun Touré, said: "The key to the information society is universal access. Everyone must have equal opportunity to participate in the digital age. And no one should be denied the potential benefits of new information and communication technologies, not least because they are hampered by their disabilities."

Three main issues have been identified by the union: accessible design, which assures issues are addressed from the start of the development process; availability, to ensure those who need them can get access to technologies; and affordability.

Yet often, it is individual initiative that leads the way. In America the idea of "voiceover internet protocol" (in which a phone call pig-



Access granted ... a blind Tibetan girl hears music via computer EPA/STR

gybacks an internet connection) has led to one blind man, Ed Gallagher, building a Skype headset and webcam into his baseball cap. A friend or succession of friends log on remotely and guide him through traffic lights and other obstacles by "working as his eyes" through the webcam.

Not every adaptation needs to be so drastic. Manufacturer Doro focuses on assistive technologies for older people and those with impairments, including simplified GSM mobile phones and easy to use TV remote controls as

well as enhanced telecommunication products.

Social enterprise firm Significan't has set up video contact centres around the UK – the specialist element being that there is a signing service so that deaf people, hitherto excluded from a lot of video conferencing, can take part.

Adaptations are available to get people with disabilities back into the workforce through use of telecommunications. Ashford Borough Council has put an IP telephony system from

Mitel for its customer service operation and notes that benefits include improved public satisfaction and better personal contact with callers. People with disabilities working from home may not be an ideal or complete answer but it facilitates employment without prohibitive costs.

The telecoms union points to a number of cases in which quality of life has been improved by more intensive assistive technologies. The ITU highlights the positive example of Marie-France, a French lecturer who was diagnosed with amyotrophic lateral sclerosis and now can't breathe without a tracheotomy, being almost entirely paralysed. She has designed her own keyboard for her Apple Macintosh computer which uses a program called SwitchXS, which allows her to control the scanning of keyboards.

The addition of a speech recognition programme has enabled her not only to shop and help her husband with his research, but she also runs a website on her illness to help other sufferers (als-testimony.org).

Experts say that the case for action is compelling. There are discrimination laws in many countries. Additionally, it makes sense economically for all societies to act: disabled people have skills and abilities and accessible technology can enable them to fully contribute to their community.

Off the grid but on the web

Richard M Kavuma

When the diesel generator was switched on and wireless internet installed at the aid agency Amref's Katine office in February, it felt almost surreal. Here was a Ugandan village without power or running water connected to the web. As one Amref staff member said: "Isn't it wonderful?"

If I had not appreciated how wonderful it was back then, I certainly did when the internet failed to work last month. The first time it happened, I had arrived before 9am ready to send an article to my editor in London. I waited several hours, but it was all in vain.

I consulted Chris, Amref's IT guru, but apparently the "machine" that was supposed to distribute IP addresses was not doing it, forcing the satellite to take matters into its own hands – and doing a poor job.

The Amref office in Katine sub-county is at least 21 dusty, bumpy kilometres away from Soroti town, so if the satellite doesn't cooperate, you might miss crucial deadlines. When my editor called, our concern



Sky's a limit ... Amref's Katine office Richard M Kavuma

was about the next day, which was the Thursday before the Easter weekend – an early deadline day. What if the internet failed again? How would I send articles?

It was suggested that if the worst came to the worst, I could dictate the story over the phone. But I could not send photos by telephone, so we were back to square one: hope. In the end, hope was enough, luckily.

Since then, I have become wiser. When I have a deadline, I try to send the photos the evening before via an internet cafe in Soroti town. But even that can be difficult. Once, the Uganda Telecom (UTL) network went off suddenly so I headed to my usual internet cafe on Soroti's Main Street, but the internet (again, provided by UTL) was also down. I tried two other cafes and they were all unable to get me online.

Other phone networks were working. So I bought myself a new SIM card from Warid Telecom, the latest entrant into Uganda's telecom market, and was able to make and receive calls. But in the countryside, you can't even take the phone network for granted. It goes down frequently. It is not unusual to send a text message on Sunday and for it to arrive on Tuesday.

In Katine, the network can be so unreliable that you can lose reception simply by facing the wrong direction. So when I am in the field office, I have to place my handset strategically on top of a filing cabinet. When it rings, I grab it, stride to a leafy tree where reception is good, and answer the call. In extremely remote villages, people have to climb trees to tap the network. I have not had to do that in Katine. Yet.

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Staying connected

Modern technology has transformed the long-distance relationship
guardianweekly.co.uk/livingabroad >>

Switching on

Developing nations leapfrog West

«Continued from page 1 or transfer cash. In the Indian state of Andhra Pradesh, the National Institute for Smart Government started an experiment last year in which people in remote communities who have smart cards (checked with fingerprints and photographs) can receive payments via itinerant staff, who use portable terminals that can link to a central database over the mobile network to check identities. It cuts fraud and travelling time in remote areas.

In March, one of the biggest mobile providers in India, Bharti Airtel, launched an “m-commerce system” that lets people send money to family and friends with a Visa card. (Vodafone and Bharti Airtel already let customers pay bills by text message; the text contains a code that authorises a payment.)

The power of such systems lies in maintaining centralised administration, while pushing out the control to less organised places. For example, in February Vodafone announced that it was introducing a mobile payments services for businesses in Afghanistan: companies can pay employees and suppliers by sending a text message to a central server and pay or withdraw cash from local agents of the service, called M-Paisa.

It is the follow-up to M-Pesa, a similar service launched early in 2007 in Kenya, which lets people without a bank account use a text message to transfer money to family and friends and withdraw cash at retail outlets including dealers selling airtime (the “fuel” of the mobile economy), petrol stations and supermarkets. For the Afghan market, where illiteracy is higher than in Kenya, there’s an extra twist: interactive voice recognition, for voice-activated operation.

The Kenyan experiment, however, could take the technology much further. Vodafone and Citigroup are piloting an international money transfer service that lets migrant workers send money home to Kenya either via their mobile phone or an internal portal. In the future, says the research company Current Analysis, Afghanistan and even India, where Vodafone has similar trials, could be the target for such currency transfers.

It’s not only the flow of legal money that’s affected. Bypassing local operatives with telecoms links to central systems can help stamp out endemic local corruption. In industrialised countries many people dislike dealing with computers and automated lines preferring to hear a human voice. But in other parts of the world, the human can be more of a barrier to getting something done than the computer.



No charge . . . mobile users can bypass corrupt local officials Dan Chung

Take the instance of getting railway tickets in India. Rail travel is the only economic way to travel the necessary huge distances involved for many. But before 2002, ticketing clerks used to keep the long-distance tickets back and sell them at a profit to those who knew how to get them.

Then the system was put online. Transparency India (part of the Berlin-based Transparency International) and the Centre for Media Studies reported in 2005 that “computerisation and issue of tickets for rail journeys . . . have ensured that the common citizen does not have to offer bribes for rail tickets.”

So while people in industrialised countries may curse automated or online systems, for India it is proving a boon. The report also found that cor-



African farmers get commodity prices by text, pushing out ‘briefcase buyers’ who turn up and offer less



ruption had fallen in the provision of telecoms in the country. More people will be able to get online for services, which will in turn be able to bypass officials trying to profit from personal transactions.

In Sierra Leone the presidential election last year – the first since UN peacekeepers withdrew in 2005 – was monitored by 500 observers, who used text messaging to stay in touch with each other and report any concerns. That followed a 2006 experiment in Montenegro, the first to use SMS for ballot monitoring; since then it has been used many times.

Chris Spence, the director of technology at the National Democratic Institute in the US, which provided the monitoring system for Sierra Leone, remarked that “in the elections where we’ve used SMS, you watch the data flow into the database directly when it is time for the monitors to report.

The system automatically sends confirmation messages back to the observer in an interactive exchange of SMS messages, so accuracy increases. At reporting time, it is quite amazing to see the numbers change on the screen as the SMS messages pour into the database.” And it’s cheap too: bulk-buying SMS messaging meant that 41,000 messages could be sent for a total cost of just \$2,400.

In the aftermath of the disputed Kenyan presidential election in December, the traditional media – such as newspapers and television – were in effect shut off, but the internet still worked; mobile phones still worked. Information could still flow.

Kenyan and, since June 2007, Zambian farmers have been able to get commodity prices through texting services, potentially expanding their markets, and their profits, and pushing out the “briefcase buyers” who would turn up at farms and offer low prices.

Announcing the Zambian initiative, its home affairs minister, Ronnie Shikapwasha, said that Celtel, the mobile carrier there, had experienced phenomenal growth, which was “an indication that the Zambian mobile phone networks had greatly contributed to the growth of the economy”.

It certainly has. Information is power – and money. A widely quoted 2005 study by Leonard Waverman at London Business School suggested that a 10% growth in mobile phone penetration led to 0.44% growth in gross domestic product.

A 2007 study of fishing crews in Kerala, southern India, by Robert Jensen, a development economist at Harvard University, found that the arrival of mobile phones meant they could call ahead to markets with news of a good catch, lowering waste and reducing variation in prices.

“The evidence suggests that the benefits of information and communication technologies can be found among fishermen or farmers, not just software engineers or call centre workers,” says Jensen. He calls the arrival of mobiles and similar technologies the “digital provide”, and remarks that “rather than simply excluding the poor or less educated, the ‘digital provide’ appears to be shared more widely throughout society.” Waverman agrees, and has frequently urged governments in developing countries to encourage competition for mobile services, to drive down prices and widen availability.

One reason why the arrival of mobile phones was so useful for the fishermen, Jensen notes, is that their cargo is perishable. The biggest gains for people looking to improve their trades will be for products with a limited life – eggs, milk, fruit, vegetables, even day labour.

Of course, for thousands in Burma, the arrival of essential products – such as clean water and any food – will also be helped if communication lines can be reinstated. That will reinforce the value of mobile phones particularly for the most perishable commodity of all after a disaster: human lives.

Switching on



The hand of friendship . . . an Indian Red Cross donation tent in New Delhi Robert Nickelsberg/Getty Images

How text messages save lives in India

A volunteer has set up a system linking blood donors with patients

Carmela Ferraro

SMS messages – texts – have been associated with television celebrity voting, quick exchanges between friends, appointment reminders, and even marketeers hawking their wares. But in India they are also used by a life-saving network.

Indian Blood Donors, which operates throughout the country free of charge, links patients who need blood with those willing to donate it locally. So far 45,000 donors have registered.

It was the brainchild of a civil servant, Khushroo Poacha, 40, from Nagpur, Maharashtra, who works for Indian Railways. He explained: “In India, because there are shortages, especially for rare blood types, patients are often asked to find their own blood. This isn’t easy for anyone. But it’s especially hard for those people who come from villages, far away from main centres, and don’t know how to get around.

“People are dying because they can’t get blood. It’s a terrible, terrible situation. And I feel a duty to do something about it.”

According to the National Aids Control Organisation, India needs 8m units

of blood a year. Last year 5.5m units of blood were collected in government-supported blood banks. Patients respond to the gap by accessing private blood banks, contacting voluntary organisations like the Red Cross, and asking family, relatives or friends for donations.

An electronics engineer, Rajesh Jasani, 31, from Mumbai, contacted Indian Blood Donors this year to find five litres of blood for his father, who was undergoing a bypass operation. “The bloodline was a big, big relief,” Jasani said. “We badly needed blood at that time, and at any cost. I contacted some of the known blood banks and didn’t get a positive reply . . . [Poacha’s] service gave us five donors within two days.”

Using the bloodline is simple. When someone needs blood, they send a text message to 5676775 in a specific format. Within seconds, they will get a donor’s name, blood group and contact details. The process then triggers an SMS to the donor with the contact details of the patient, and the donor and the recipient organise the blood donation between themselves. If the donor for whatever reason is unable to help, the patient or their family continue sending SMS messages to other donors on the list.

Poacha says that donors are very committed to helping others, and will often happily go out of their way to give blood. Vijayeendra Kulkarni,

32, from Mumbai, says: “I did not mind negotiating time off from my work and travelling the hour and 30 minutes in the metro from my home to donate blood. It was a very important and satisfying thing to do. He [the patient] was so happy to see me that he started crying.

“He offered a cup of tea and also said that he was ready to pay my travelling expenses, but I refused it. It’s as if there was some one who was very thirsty in a desert and all I had to do was to help him with a glass of water.”

The SMS bloodline has been operating since December last year, an extension of a website that Poacha started with his wife Fermin in 2000. The inspiration came after a visit to his grandmother in hospital where he witnessed a violent confrontation between the doctor and the family of a patient, who had just died for want of blood. It also came from his own failed, later, attempts to find blood for an acquaintance in need.

“About that time everybody was launching a website,” explains Poacha. “I’m just an average sort of person. And I didn’t have any special IT skills or interests.

“But one day as I was emailing my cousin in an internet cafe, I suddenly realised that I could make a website that would create a bridge between a patient and a donor and indianblood-donors.com was born.”

Poacha says that before the recent

addition of SMS to his blood service, people used to place their details on a public list on the site. However, with unscrupulous marketeers abusing the system, he was forced to remove it and to organise the calls between donor and recipient himself. People rang from all over India, 24 hours a day.

Poacha says that he subsequently became stretched personally as well as financially and he was haunted by a comment that someone had made about the service: “In an emergency, where is your common man going to find an internet cafe in the middle of the night?”

Says Poacha: “Then one day as I was watching a cricket match my wife asked me to get some groceries. As I was shopping, I was curious to know the cricket score and sent out an SMS to get it. I realised then that my answer lay in the power of this technology.”

Poacha says he began the service with a second-hand computer and personally funded it. “I don’t earn a single rupee from the bloodline,” says Poacha. “Apart from a few volunteers, the enterprise is essentially the work of an ordinary, middle-class person and his wife.

“The donations and the little advertising revenue that we get cover about 40% of our running expenses; the rest I still fund myself. But I’m very happy to support it. Everybody has a calling. Some people like to play golf, I like to help people.”

Switching on

Beam me up: degrees for everywhere

Stephen Hoare

Imperial College's MSc in communications and signal processing may be the oldest postgraduate telecommunications degree in the UK. The course leader, Professor Anthony Constantinides, says: "It's been running for 35 years and it has been the template of all MScs in this area. Of course, that doesn't mean the content is in any way old or out of date. We teach the latest technology in wireless communications and mobile systems."

The degree attracts a high proportion of overseas students. Competition for places is high, as is the quality of applicants.

Constantinides says: "We have 500 applications each year for just 50 places. Students come from around the world but the biggest cohort by far is Chinese. Most are working for western telecoms companies that have set up in Shanghai or Beijing. Chinese telcos have also been developing at a phenomenal rate, starting from zero."

The degree does not teach specific

applications for the developing world, but concentrates on the latest technology, which overseas students adapt to meet the needs of their countries.

"In the developing world, it is perfectly viable to set up mobile networks using base stations and possibly also with satellite links. Fibre optics just isn't a viable option," Constantinides says. He explains that a UK postgraduate degree is not high-level technical training in the latest software but an education in the principles of software design. "We teach clarity and vision and that's what industry wants."

Postgraduate teaching and research are supported by the EPSRC, the engineering and physical sciences research council. Funding for UK masters students has been cut back but the EPSRC supports international studentships for projects in developing countries.

It is a growing area: Glasgow University has just launched an MSc in telecommunications to prepare undergraduates from engineering, mathematics and physical sciences for a career in global telecommunications.



Yousef Hamouda is doing a PhD in electrical engineering at QMUL

Queen Mary University of London runs MScs in telecommunications and wireless networks. A high proportion of its overseas students are from Pakistan, India, Sri Lanka and China. Dr John Schormans, senior lecturer in electronic engineering, says that telecommunications issues are different in each developing country, although

they all need highly skilled technicians. "Postgraduates go to work for international companies like Vodafone, Nortel or Oracle where they have mobile international careers. I had a Pakistani student who completed his PhD, went to work for Motorola in the UK. They sent him to Pakistan and then on to Dubai."

QMUL has a joint venture with Beijing University of Posts and Telecommunications for the B(Eng), which allows many UK faculty staff to teach in China. This will be extended to the MSc in telecommunications from next year. Overseas students also reflect high mobility.

Mauritian Vishwedha Busawon won a Chinese government scholarship, learned Mandarin, and graduated in computer sciences and engineering from Huazhong University. She is now taking a QMUL MSc in interactive systems: "I worked for two years after my degree for Accenture in Mauritius doing software engineering. I think I might stay on in the UK and do a PhD and see where that will take me."

2200 BC: Access to the Universe



2008 AD: Universal Access

While the International Telecommunication Union (ITU) hasn't been around as long as Stonehenge, it has been around since 1865: shaping standards, building consensus and connecting the world. At ITU, we believe that telecommunication services should be easy to use. For everybody. Regardless of age, health or physical ability. That is why at this year's World Telecommunication and Information Society Day (WTISD), our special theme is Connecting Persons with Disabilities: ICT Opportunities for All. The ancients were focused on access to the universe; at ITU our focus is universal access.

www.itu.int/wtisd

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