



expanding horizons

2/2007

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helps medical research**

**ICT and the challenge
of climate change**

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Fueling a future full of promise

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new horizons

Areeba maintains its position as Ghana's top operator with more than 2.6 million subscribers.

Growth in Ghana

If you leave Accra, the capital of Ghana, and take a trip along the coast, you regularly see billboards that inform you how many kilometers it is to the next town or city. The signs are sponsored by various mobile communications operators and also advertise that you are within signal range if you wish to make a call.

More and more of these signs will be needed; the Commonwealth Telecommunications Organization reports that in 2006 Ghana scored the highest growth rate in all of Africa in telecommunications penetration. Mobile phone subscribers accounted for the vast majority of the increase. Mobile penetration now stands at 25 percent, says Ghana's deputy minister of communications, Mr. Benjamin Aggrey Ntim.

GSM glossary

GSM (originally "Groupe spécial mobile," later changed to "global system for mobile communications") The most popular mobile communications standard in the world, with a market share of 84 percent. Includes the following solutions and technologies:

- **GPRS** (general packet radio service) The first generation of a GSM packet data connectivity solution based on internet protocols.
- **EDGE** (enhanced data rates for global evolution) An enhancement to GPRS speed and capacity.
- **3G** (third generation) A generation of networks with enhanced data rates and the ability to transfer voice and data in parallel.
- **WCDMA** (wideband code division multiple access) One of the main technologies for the implementation of 3G.
- **HSPA** (high-speed packet access) Enables a smooth, cost-efficient upgrade to WCDMA at minimal cost; sometimes called 3.5G. Consists of HSDPA (downlink) and HSUPA (uplink).
- **LTE** (long-term evolution), also called **4G** (fourth generation) The next generation of GSM technology, still being researched and developed.

EDITORIAL



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WORLDWIDE, GSM is utilized more than any other mobile communications standard, with more than 700 operators and more than 2.3 billion subscribers. This issue of *Expanding Horizons* looks at the philosophy and the technology behind GSM, as well as the promising future ahead.

Another article highlights the importance of deciding what the most appropriate technology is, in addition to considering the newest technological advances, when a technological solution is being selected. This ensures that the solution will fit local cultural and economic conditions.

We also see how ICT can contribute to meeting the challenge posed by climate change, and how mobile phones are helping African researchers collect data that will help people analyze the causes and spread of malaria.

Many mobile phone features that numerous customers find useful started as adaptations to make the devices more accessible to people with disabilities. Vibrating and flashing alerts for incoming calls are two of the most prominent examples. In this issue we show that ensuring the accessibility of mobile devices not only helps spread the benefits of mobility, but is also good for business in general.

These and other information-packed articles offer you a useful and enjoyable reading experience!

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Quick growth stats

Bangladesh had more than 20 million mobile phone subscriptions by the end of 2006, almost double the amount it had a year earlier. Pyramid Research predicts that the figure will reach 40 million in 2009.
Source: The New Nation and Pyramid Research

Asia surpassed one billion mobile subscribers in December 2006, according to a study released by Wireless Intelligence. Both China and India are adding about six million subscriptions each month, while they boast total subscriber figures of approximately 450 million and 150 million, respectively.
Source: SDA Asia

Out of the 101 million mobile subscriptions in Brazil in early 2007, 64.7 percent are now GSM, says Brazilian regulator Anatel.
Source: Business News Americas

Latin America finished 2006 with 208 million GSM subscribers, an increase of 81 million for the year. In Latin America GSM outnumbered CDMA by almost 2.5 to one.
Source: 3G Americas

Bluetooth technology continues to grow in popularity worldwide, a survey conducted by research firm Millward Brown indicates. In China, 93 percent of respondents – 12 percentage points more than the survey's global average – showed awareness of Bluetooth and its uses, such as data transfer and headset-to-mobile-phone connection.
Source: Bluetooth Special Interest Group

Mobile development in India

One out of every five citizens in India will own a mobile phone by the end of 2007, according to a new study published as the *Mobile development report* by the Center for Knowledge Societies. By the end of 2008, 75 percent of India's population will be covered by a mobile network.

The study looks at how mobility could be used to bridge the growing economic and social digital divide between rural and urban areas. The document identifies seven service areas that could be transformed in rural communities by mobile communications: transport, microcommerce, finance, healthcare, governance, education and infotainment.

The study encourages governments, the mobile industry and nongovernmental organizations to cooperate to help develop these services by increasing access to, and use of, mobile communications in rural communities.

Reaching the next 50 million

A new GSM Association study of Pakistan's mobile market finds that the country is benefiting economically and socially from increasing mobile phone usage and low tariffs. With 50 million subscribers and 30 percent penetration, Pakistan is a regional leader in mobile usage. The nation's mobile industry accounts for 5 percent of its gross domestic product and 6 percent of total taxes collected.

The study suggests that a beneficial next step for Pakistani policy-makers would be to eliminate the activation tax of 500 rupees (8.25 US dollars). The government's total tax revenues would actually increase, as mobile usage and economic growth would increase. In the ten years after the activation tax was dropped, an additional 132 billion rupees (2.17 billion US dollars) in other taxes would be received because of the positive impact on the mobile industry and its spillover effect on the rest of the economy.



The number of GSM subscribers in Latin America is rising strongly.



Photo: Jean-Marc Ferré/ITU

International Telecommunications Union (ITU) secretary-general Mr. Hamadoun Touré, who took office in January 2007, talks about his vision of the future.

Creating optimal connections

What are your plans for the future of ITU?

I see ITU as a forward-looking, dynamic organization that contributes to ICT growth and development by promoting an enabling environment, connecting everyone to the benefits of ICT, developing technical standards, facilitating the efficient use of radio-frequency spectrum and establishing dialogue between the private sector and governments and between innovators and policy-makers.

My priority will be to work with the membership towards bridging the digital divide. Before the end of 2007, there will be three billion mobile phone users, and most of the newest billion come from the developing world. We may be well on the way to solving the quantity dimension of the digital divide, but an urgent need now is to tackle the quality dimension, in making broadband and 3G mobile more widely available.

What mobile communications issues are the most pressing for you as ITU secretary-general?

The private sector and the market form the driving forces. However, there are areas where an intergovernmental agency like ITU plays a significant role, such as helping member states agree on how to use the spectrum most effectively. In standardization, ITU has contributed

significantly to developing a harmonized family of standards for third-generation (3G) mobile systems, and is now working on interface specifications for services beyond 3G.

Another issue is the use of ICT for disaster preparedness, mitigation and relief. Mobile solutions are often the most practical in emergency situations, and ITU will work with its partner organizations in the UN and elsewhere to improve coordination and provide rapid response capability.

How will ITU help achieve the connectivity and development goals outlined at the World Summit on the Information Society (WSIS)?

Mobile technology is essential for connecting the unconnected, especially in rural and remote areas. Governments, of course, play a major role in achieving the WSIS connectivity targets, through both national programs and participation in multistakeholder efforts such as ITU's Connect the World initiative, which encourages partnerships and projects that bridge the digital divide.

One of government's major roles is to establish a transparent, effective policy and regulatory environment so the private sector can invest in infrastructure and services. In addition, governments should have a targeted approach to capacity building. Governments can also work

in partnership with the private sector to extend infrastructure and services in rural and isolated communities. We need to look at creative solutions, including shared infrastructure between operators. ITU's Telecommunication Development Sector is strengthening the regulatory environment through mechanisms such as the Global Symposium for Regulators.

What are ITU's messages to operators, regulators and policy-makers for the future?

The ITU constitution promotes extending the benefits of new telecommunications technologies to all the world's inhabitants. Operators can extend coverage to rural areas and provide affordable access. They can leverage their success in providing mobile voice services to ensure access to high-speed internet access and the rich applications it can offer to developing countries.

Regulators and policy-makers can optimize their roles as ICT access facilitators. They can ensure that regulatory frameworks leverage advances in new technologies and business practices to increase access. Regulators and policy-makers play a catalytic role in providing incentives and flexibility to operators while protecting the interests of consumers by ensuring availability of low-cost services. ■

In brief: What will the future bring?

"The mobile industry has been good at delivering high-speed capacity over short distances, as with WiFi, and low-speed capacity over large distances, as with GSM," says Hamadoun Touré. "On the horizon are new technologies such as 3G mobile and worldwide interoperability for microwave access (WiMAX), which promise to deliver high capacity over long distances. This is probably the most

exciting current technical development. Combining mobile communications with other technologies, such as location-based services, radio frequency identification (RFID) readers and music and video devices, will also lead to the mobile phone becoming a universal, multipurpose device."



Choosing appropriate technology includes consideration of not just technical aspects, but also environmental, cultural and economic factors.

Photo: Nathan Eagle/EPROM

Applying appropriate technology helps create sustainable solutions. In new growth markets especially, “appropriate technology” signifies much more than just the technology itself.

More than **technology**

Policy-makers, regulators and operators pondering possible solutions for expanding the scope, efficiency and usefulness of mobile communications can find insights in the work of nonprofit organizations. Mr. Ken Banks, an anthropologist and technologist and visiting

scholar at Stanford University in the Reuters Digital Vision Program, has spent the past 15 years dealing with ICT solutions for nongovernmental organizations and other groups involved in new growth market social and environmental development initiatives. He believes that a key principle of ICT

projects revolves around the application of appropriate technologies that are primarily needs-driven or people-driven, rather than technology-driven. Banks explains, “Appropriate technology means the technology most appropriate to the environmental, cultural and economic situation.”

“Needs-driven” refers to a technological product or service responding to real needs of the target community or customers. Development of these technologies should also be people-driven. “People are different all over the world,” says Banks, “so local customs, social context and infrastructure need to be considered.” By contrast, a technology-driven solution would be more about simply implementing the latest technology rather than specifically aiming to meet people’s needs.

Communications in local context

“We should not just march on and on with technological advancement, without reflecting on what we are doing

and who we are ultimately doing it for,” Banks continues. Local context – cultural, social and physical – needs to form an important aspect of mobile communications projects.

“Developing tailored products and services for new growth markets is now seen as the best way forward,” says Banks. “We can expect to see more of this as the bottom of the economic pyramid increasingly becomes a focus.” He cites an example of a service designed specifically for new growth markets: “Vodacom’s ‘Call me!’ service in South Africa allows users to send a free SMS requesting to be called back.”

In some mature markets, customers are charged to both send and receive calls and text messages – a business model that Banks says would likely falter in new growth markets for lack of compatibility with local conditions. “If this model had been replicated en masse in new growth markets,” he comments, “then we would not be having this conversation right now, because mobiles would not have become the engine of this amazing revolution we are experiencing today.”

Sustaining solutions

In his work, Banks lists economic value as part of his recipe for a sustainable mobile communications project – one that will someday be able to carry on

without continuing financial support or subsidy. “One World’s Kazi560 job alert service in Kenya has found the balance perfectly,” he says. “Users get economic value – jobs and income – so it is a cost they are willing to take.”

Financial stability, whether in the nonprofit, private or public sector, is not always easily achieved. To ensure that local context is taken into account, Banks “sense-checks” potential solutions against grassroots reality. Are the assumptions that form the basis of the project proposal or business plan consistent with the onsite situation? Engineers, programmers and planners have not necessarily had exposure to the prevailing conditions. For example, will local traditions make citizens wary of giving their phone numbers to field workers, even if it is for a good cause such as disaster warnings via SMS?

“Internet access via wireless devices is still a long way off for rural communities in new growth markets,” says Banks. He hopes that dialogue will result in the “appropriate, relevant applications” that hold so much importance. Technology, he notes, “will not bridge the digital divide alone.” ■

For more info about the work of Ken Banks, see www.kiwanja.net, where “technology meets anthropology, conservation and development.”

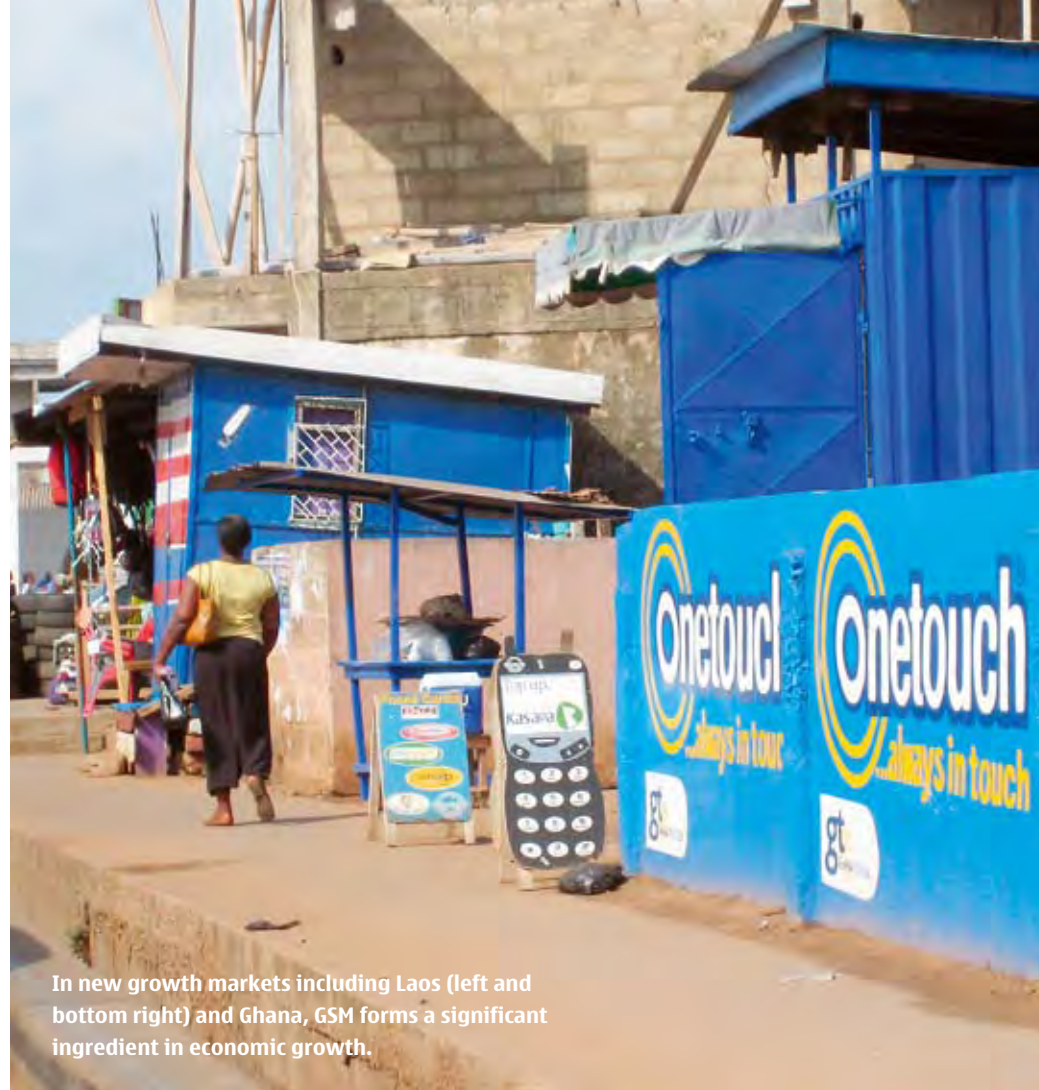
Success stories

- **Kazi560** Kenyan job-brokering service notifies subscribers of employment opportunities via SMS. People see value in paying for the service, which has filled more than 60,000 jobs since its launch. www.kazi560.co.ke
- **FrontlineSMS** Standalone SMS hub developed by kiwanja.net requiring a PC and a GSM phone. Meant for new growth market conditions, it allows organizations in areas with sparse infrastructure to communicate with users, staff and communities. www.frontlinesms.com
- **Entrepreneurial Programming and Research on Mobiles (EPROM)** In Kenya, computer science students are taught to create applications for mobile phones, not just PCs – prime example of a project that builds future capacity. web.mit.edu/eprom



lead story

Photo: Pasi Kemmo



In new growth markets including Laos (left and bottom right) and Ghana, GSM forms a significant ingredient in economic growth.

Big world, bright future for GSM

Twenty years after its creation, GSM is by far the world's most popular mobile communications standard. With an underlying philosophy of openness and the capacity to evolve, it looks set to continue its success far into the future.



Photo: Pasi Kemmo

As the GSM mobile communications standard celebrates its 20th birthday in 2007, it accounts for more than 2.3 billion subscriptions, nearly 84 percent of the world's mobile phone users. The key factors supporting its market dominance include its ability to evolve technologically and its continuously increasing economies of scale, as well as an underlying philosophy of cooperation between industry players.

It is common to speak of GSM evolution. The standard covers a succession of interoperable innovations, so progress continues without making earlier GSM equipment incompatible. The terms general packet radio service (GPRS), enhanced data rates for global evolution (EDGE), wideband code division multiple access (WCDMA), high-speed packet access (HSPA) and long-term evolution (LTE) simply denote technologies that enhance and extend the initial GSM system in multiple ways, always including fully compatible fallback to GSM. Each evolutionary step represents an improvement to network equipment and handsets, each leading to greater speed, capacity and efficiency, as well as the introduction of new services.

Economies of scale encourage competition and innovation, and mean that a large choice of suppliers is available. Developers want to put their resources into the big, global volumes offered by GSM. All of this results in ever greater flexibility and better total cost of ownership (TCO) for operators and consumers alike.

Grand scale

When you ask industry insiders to describe why GSM enjoys such success and continues to increase its dominant market share, the huge economies of scale are the first thing they mention. "Serving a market of more than two billion users worldwide and one that is growing by a million users a day, vendors can produce GSM handsets, infrastructure and other equipment in large

volumes at very cost-effective prices," says Mr. Rob Conway, CEO of the GSM Association (GSMA).

Mr. Alan Hadden, president of the Global mobile Suppliers Association (GSA), agrees: "The scale gets bigger every year, and it is at the forefront of anything you do because it drives the economics. GSM's market share grew 3.5 percentage points in 2006, when it added half a billion subscriptions." In fact, this GSM one-year total equals more than all other mobile communications standards put together – for all time, going back to analog and including GSM's competitors, code division multiple access (CDMA) and personal digital cellular (PDC).

"The new growth markets of Africa, Asia, India and Latin America are driving scale today, because these are the engines of growth in subscriptions," says Hadden.

"The explosion of GSM usage in developing countries has been the most exciting phenomenon of recent years," adds Conway. "It is fueling social and economic development in many countries."

Success factors

The present GSM success factors, including economies of scale, can be traced back 25 years to the early days of mobile phones. In 1982, European regulators and operators decided that full interoperability should be a goal. A small network holds value for the community, but in a large network or a network of networks, the value for the community is exponentially multiplied.

"That starting point is what makes GSM so different from any other competing networks," says Mr. Timo Ali-Vehmas, vice president of standardization and industry relations at Nokia. "GSM is a philosophy. It is a way people behave, building networks and making them all compatible." This spirit has also been reflected as a collective will among regulators, GSM operators and other industry players to ensure that information is shared and to avoid placing

roadblocks and bottlenecks in the way of GSM progress.

The basic idea of openness and agreement supplements healthy competition and allows GSM technology to grow rapidly and effectively, which in turn attracts innovators and investment that fuel more growth.

GSM began with governments, operators and manufacturers who believed in a vision of a harmonized international network and reached agreement about the initial specifications. This year marks the 20th anniversary of the 1987 GSM Memorandum of Understanding, in

The explosion of GSM usage in new growth markets is fueling social and economic development

which government representatives and cellular operators from 13 countries committed to procuring GSM networks and introducing them by 1991. The underlying philosophy remains, reflected for consumers in an advantageous TCO, a large choice of products and services, uncompromised compatibility and also easy roaming between networks.

Extending flexibility

For the more than 700 GSM operators worldwide, GSM offers excellent scalability, meaning network capacity can be increased quickly if necessary. "Whether an operator wants to start small and expand or start big and grow bigger, GSM is flexible enough," says Hadden. He is talking not only about high-quality, cost-efficient network equipment, but also about the range of technologies within the GSM family.

EDGE forms one step in GSM evolution and exemplifies the way GSM fosters innovative growth. A solution that can be added to an existing GSM network to increase capacity for voice and allow for

more data-intensive services such as internet access, EDGE has become so widespread that it can now be considered mainstream in new growth markets. It forms part of GSM technology's third generation (3G), which also includes WCDMA and HSPA – all of them enhance data rates and make possible parallel transfer of voice and data.

In new growth markets progress can be rapid from entry level to increased demand for internet and large data capacity. Both levels can exist side by side, as well. Operators benefit from GSM's flexibility in adapting to all these situations.

International ecosystem

Conway refers to GSM and its surrounding technologies and operations as "the GSM ecosystem." The ecosystem is developing in many directions.

"Across Africa, Asia and Latin America, operators and entrepreneurs are using mobile phones to plug gaps in the infrastructure countries need for social and economic development," says Conway. "According to the World Bank, the capital cost of providing mobile coverage to an individual is one-tenth of the cost of installing a new fixed-line connection, so it makes financial sense for most of the world's population to access the internet over the air rather than through wires."

Banking can also be accomplished over the air. "In Kenya, the Philippines, South Africa and other countries, millions are using their handsets to transfer money or pay for goods and services," he says. "The GSMA is working with the financial services industry to link national mobile payment services together so that people can use their mobile phones to send and receive money internationally. That would make it more cost-effective for migrant workers to get money to their families back home and could dramatically boost this vital income in many developing countries."

In international contexts, GSM's global market dominance forms an

undeniable advantage over other systems with more limited areas of influence.

Clear path

For all involved, GSM represents not only an emphasis on the lowest TCO today, but also a clear path for the future, with a progression of advancements up to the fourth generation (4G), known as long-term evolution (LTE) technology, and beyond. GSM handsets, networks

and additional technologies are "constantly evolving and improving," says Hadden. "The roadmap is there; everybody can see it."

Conway follows up by putting it in terms of statistics. "You can make and receive GSM phone calls across the world in 218 countries and territories," he says. "GSM networks now cover more than 80 percent of the world's population, and we expect that figure to rise to more than 90 percent by 2010." ■

A growing number of operators in South America and elsewhere are changing to GSM.



Photo: Pasi Kemmo

Making the switch

According to research published by the Global mobile Suppliers Association, some 30 mobile network operators are replacing CDMA with GSM or overlaying CDMA with GSM. There have been no changes from GSM to CDMA.

Operators seeking to make the switch can learn from each other by comparing notes with companies that are not direct competitors. Many experiences point toward a switchover phase during which the two networks run parallel for a period, as opposed to trying to bundle two widely different systems together in the same package.

Customers then migrate gradually to the GSM network. This method requires some spare spectrum, so the process has to be started before the spectrum available to the operator becomes fully occupied. From an operator's perspective, GSM's advantage consists of its ability to save them money. It simply represents the most efficient way of using capital and keeping total cost of ownership down.

Accessibility unlimited

Mobile devices tailored for people with disabilities help spread the benefits of mobility. The products also make good business sense.

As mobile communications continues to revolutionize the way we communicate, access to mobile communications will soon be regarded as a basic human right. People with disabilities or limitations in hearing, speech, vision, mobility or cognition form about 18 percent of the world's population, if disabilities related to aging are included. Mobile industry players can make the benefits of mobility accessible to people with disabilities by creating innovative features and design adaptations.

More than 600 million people have life-altering disabilities; two-thirds of these citizens inhabit new growth markets. Accessibility for people with disabilities represents a mainstream issue for the mobile industry.

Features and functions

Vibrating and flashing signals help people who are deaf, but are also widely used by others when they wish to keep their phones from ringing audibly. Voice-controlled functions help users who are blind or have trouble pressing buttons; they also benefit motorists and others who need to keep their hands free while operating a handset.

Other accessibility-enabling features include a talking clock, graphic menu icons, adjustable font sizes, applications that read messages aloud and Nokia Xpress Audio Messaging, a service that utilizes multimedia messages (MMS) to

let users record and send audio messages in a similar way to text messages.

Greater interaction

The number of people over 65 years old is set to double by 2025. In many new growth market countries, particularly in Latin America and Asia, the older population is expected to increase by up to 300 percent in the same period.

Whether a disability is age-related or not, certain benefits of mobile communications apply to all users with disabilities. It facilitates interaction with government, businesses and even banks without trips to their premises. Mobile communications also improves the ability of people with disabilities to find employment. People who are deaf can run businesses by interacting with suppliers and buyers via text messaging, for example.

New solutions are continuously being developed. Governments, manu-



Speaking clocks and iconic contact lists increase accessibility. The Nokia loopset (top) makes mobile use easier for people with T-coil hearing aids.

facturers, advocacy groups and operators work together to identify the most pressing needs and provide communication tools and services for people with disabilities. ■

Business angle

- Ensuring accessibility for users with disabilities makes good business sense. It often reaches an untapped market. It provides socioeconomic benefits, especially in new growth markets: communication with family, friends, caregivers, employers and customers. The companies providing these opportunities improve their brand loyalty and corporate image.
- Features that enhance accessibility for people with disabilities often become popular among other users, which translates into a greater number of customers utilizing a wider range of services.

Kenyan researchers team up with leading universities to create a mobile-phone-based system that helps gather field data crucial to understanding and fighting malaria.

Mobilizing against malaria

For more than a decade, the Kenya Medical Research Institute (KEMRI) has been conducting demographic surveys in the nation's eastern district of Kilifi to research and combat the region's unusually high malaria infection rate. By monitoring the health and demographic factors of the approximately 200,000 citizens in the area, researchers can better comprehend the spread of the disease and develop responses.

To improve the efficiency and accuracy of data collection and input, KEMRI has been collaborating with University of Nairobi (UON) and Massachusetts Institute of Technology (MIT) to replace the paper-based data collection system with innovative, mobile-phone-based methods. The project forms part of MIT's Entrepreneurial Programming and Research on Mobiles (EPRoM) program, which fosters education, research and entrepreneurship related to mobile phones.

"By tracking the dynamics of what is happening in this community over a long period of time, KEMRI researchers have a better shot at inferring percentages and possibilities of outbreak," says Mr. Nathan Eagle, a visiting lecturer at UON and research scientist at MIT, who is leading the mobile data collection project. "How do changes in disease outbreak correlate with demographic

changes during the same period?"

For data collection, KEMRI relies on field workers who visit villages and homesteads at four-month intervals to conduct interviews. In the paper-based system, they record the responses on paper forms and the data – births, deaths, illnesses, building activity and movement of people – is later entered in KEMRI's electronic medical database for future comparison and research.

Mobile advantages

The paper-based system contains many sources of error. Before visiting a location, field workers print out records of the previous visit. They return to KEMRI with updated data. Other employees input the information. Anything from untidy handwriting to data-entry errors can interfere with reliability.

The mobile-based solution Eagle and his team are implementing addresses these issues, while keeping the technological interface simple by utilizing a device familiar to field workers. "There are a variety of survey tools that people are using in the field for surveys and data collection," says Eagle, but "phones have two real advantages" over other options such as personal digital assistants (PDAs).

"First, most of the field workers have their own personal mobile phones, so they are very familiar with text entry

on the device. They are inherently more comfortable with a phone, and do not need much instruction in navigating the menus or inputting text.

"Second is the connectivity. Mobile phones have connectivity lacking in other devices, such as PDAs. Because mobile phones allow field workers to receive and send data while in the field, they can stay out longer and collect more data" without returning to KEMRI to print out or hand in papers or connect a PDA. Background information can be uploaded to the phone and the new data is pushed directly to KEMRI's database over the air.

Efficient information: Field workers use mobile phones to transmit data over the air to the Kenya Medical Research Institute server.



"Cell tower information and built-in or Bluetooth-enabled GPS connectivity allow us to record latitude, longitude and time for each visit," says Eagle. This encourages greater field-worker accountability while also helping to reduce errors.

Attracting interest

Field tests and evaluations of the project are returning encouraging results. Other nongovernmental organizations (NGOs) have already taken note of the project – Eagle has received inquiries about how to switch PDA-based projects to mobile devices.

"Three fourth-year students at UON developed this in less than a year using the Python programming language on Series 60 devices," says Eagle. "Python is something you can pick up relatively fast."

EPRoM's goals include incorporating mobile phone programming into computer science departments in Ethiopia, Kenya, Rwanda and South Africa, paving the way for future innovations and enterprises. The KEMRI project shows the opportunities offered by mobile phones, which are cheaper and more widespread than other options, such as PDAs and computers.

"Our application should work for any type of survey in rural areas, and there are many reasons to do surveys in these new growth markets," says Eagle. Real-life benefits are on offer if data can be collected and organized conveniently and efficiently. "One of the major research goals of the KEMRI is to uncover the fundamental mysteries that underlie malaria, a disease extraordinarily prevalent in the Kilifi district," says Eagle. "Hopefully increased understanding of this population will lead to increased understanding of the disease." ■

For more about EPRoM: web.mit.edu/eprom

ICT responds to the climate challenge

The ICT industry can play an important role in introducing new technologies and solutions to help reduce global warming. Many actions taken now will have a significant effect on future generations.

Climate change is a major challenge to mankind, affecting everyone and urgently requiring a long-term global solution.

The Stern Review on the Economics of Climate Change, published in October 2006 by the UK government, states that climate change is the greatest market failure the world has ever seen, and may lead to unexpected migration trends; disruption of distribution and workforce; and disruption in global supply chains.

The report also highlights that increases in carbon dioxide emissions and greenhouse gases caused by human activities are strongly related to global

efficiency of production and planning, make transport systems more intelligent and increase energy saving in buildings. ICT-based services and working methods such as electronic commerce, substitution of products with services and everyday solutions like remote work and videoconferencing can also mitigate climate change by reducing the need to travel."

Making a difference

A further environmental benefit can be gained through dematerialization – reducing the consumption of materials used in a product or replacing a physical product with a nonphysical solution. "As digital products converge into multi-functional devices and many continue to miniaturize, the amounts of materials and electronic waste are also reduced. This helps improve the mobile telecommunication sector's own environmental performance," says Louhi.

Even though Nokia does not operate in a very energy-intensive industry, its environmental strategy includes an action plan to address climate change by improving energy efficiency in all relevant areas contributing to its direct and indirect carbon footprint. These include using energy efficiency targets in its products, supply chains, offices and manufacturing sites, as well as leveraging mobile and virtual tools in working methods and management practices.

warming. The appropriate use of ICT can contribute in addressing the challenge of climate change.

"While the ICT industry only accounts for a little over 1 percent of global energy consumption, the real benefit ICT and mobile technology offer is that they enable sustainable behavior and practices," explains Mr. Jyrki Louhi, senior environmental manager at Radio Networks in Nokia Networks.

"ICT can, for example, improve the



Photo: iStockphoto

Although new technologies may make things possible, there are still choices to be made. ICT does not provide a magic wand to make all business processes sustainable, any more than it necessarily makes them more efficient.

If the full potential of ICT is utilized, it can make a major difference in combating climate change, while at the same time contributing to economic growth through accelerated technology development, business innovation and structural change. But this will mean that we need to challenge the way we think and make decisions, and start implementing innovative ICT-based solutions to replace more energy- and material-intensive activities.

"Nokia has committed to 25 percent green energy sourcing for its electricity needs globally," says Louhi. "Energy efficiency will also be a key strategic focus area of Nokia Siemens Networks." ■

Intuitive balance

A fresh range of entry-level handsets combines style and practicality, offering the innovative features that consumers in new growth markets desire at affordable prices.

When it comes to mobile devices, one size – or in this case one model – does not fit all. Each individual consumer is different. Based on this insight, Nokia is expanding its entry-level phone portfolio with six new phones. The popular styles, useful features and affordable prices represent chances for operators to diversify and differentiate their range of services via handsets that appeal to various groups of consumers.

Three of the new phones – the Nokia 1200, Nokia 1208 and Nokia 1650 – contain functions that make shared-phone situations easy to manage and lower barriers for first-time purchasers. The multi-phonebook feature allows separate phonebooks to be created for different users of the same phone. Also, whether selling mobile phone services as an entrepreneur or sharing a personal handset with friends or family, a consumer can set duration and cost limits on calls with prepaid-tracker, time-tracker and cost-tracker features.

The Nokia 1200 is extremely durable and includes a built-in flashlight. Its intuitive ease of use, complete with a demo mode, helps all customers get the most out of its features and overcomes the access barrier for people who are illiterate. The Nokia 1208 offers the same features as the Nokia 1200, with the added appeal of a color screen. The Nokia 1650 attracts customers with its metallic-looking design details, FM radio and local language support, as well as similar features to the Nokia 1208. All three phones use improved power-efficient software to ensure long talk times and standby times.

Advantages for operators

The Nokia 2630 and Nokia 2760 place emphasis on design while still achieving a balance between style and practicality. The slim Nokia 2630 offers a camera; GPRS email and internet; Bluetooth; FM radio; multimedia messaging and audio messaging. The colorful, folding Nokia 2760 conveys a greater sense of status and includes the same features, plus video camera capability.

For perfect balance between work and leisure, the Nokia 2660 contains a 500-entry phonebook, an organizer and a long battery life within its contemporary fold design. It also offers a feature set similar to that of the Nokia 2630.

The six new phone models offer choice for everyone and will encourage customers to increase their use of voice, messaging and data services, bringing new traffic to operators' networks. ■



Six new handsets are geared toward new growth markets (top to bottom and left to right): Nokia 1200, Nokia 1208, Nokia 1650, Nokia 2630, Nokia 2660 and Nokia 2760.



Inside this issue

GSM technology continues to expand in new growth markets. Its global market share is currently about 84 percent. The success of this mobile communications standard is based on more than technology – throughout its 20-year history, industry players have shown a spirit of openness and cooperation that has allowed GSM to grow and develop.

Global warming, mobile medical data collection and device accessibility for people with disabilities form the subjects of other articles. Read about these and other current topics inside *Expanding Horizons* magazine!