INTERNATIONAL TELECOMMUNICATION UNION

No. 8 — October 2011 — Special edition

# ITU NEWS

www.itu.int/itunews

## Living in a world of 7 billion people

## Digital cities for a better future

### The Millennium Villages

### Measuring the information society

### Connect a School, Connect a Community

### Social media

ITU TELECOM WORLD '11

Geneva, 24-27 October 2011

# We are looking forward to meeting you at the ITU Telecom World!


## Tomorrow´s Communication Designed Today

System Solutions and Expertise for
Radio Spectrum Management and
Network Planning & Engineering.

Visit us at our booth no. 5054

LS telcom

www.LStelcom.com

# Join ITU Telecom World 2011 and help shape the ICT future

Dr Hamadoun I. Touré
ITU Secretary-General


*From 24 to 27 October in Geneva, ITU Telecom World will provide unrivalled opportunities to network, collaborate, build consensus and create real vehicles for change that open up markets, empower innovation and transform lives.*

## Broadband bounty

The Broadband Commission for Digital Development and ITU Telecom will jointly host a Broadband Leadership Summit, where Heads of State, industry leaders, policy-makers and visionaries will debate the obstacles and opportunities in deploying broadband infrastructure and services. In today's economic climate, it is important to explore the role of broadband as critical infrastructure for promoting economic growth, trade and productivity.

As broadband infrastructure is rolled out in different countries around the world, the information, knowledge and education that can be provided via broadband services are fast becoming global public goods. What are the high-level policy perspectives regarding the broader benefits conferred by broadband? How will broadband networks and services be financed? What are the optimal devices for accessing the Internet in emerging markets? And how access can be extended across all segments of the purchasing pyramid?

Broadband promises to transform the provision of health care and education in developed and developing countries alike. But how can broadband help in achieving the Millennium Development Goals? Heads of State of developing countries will have the opportunity to share their vision of how broadband infrastructure and services can best be put to work for the maximum benefit of people in developing countries.

## Industry investment for a smart society

Industry leaders will set out their ideas for a networked future, examining all the areas in which investments must be made to make society smarter. Technology does not grow in a vacuum, but must be accompanied by investments in innovation, the provision of next-generation services and regulation to generate a smart society.

Can the supply of infrastructure keep up with the explosion in demand and growth of traffic? This central question will be explored in depth.

ITU TELECOM WORLD '11
Geneva, 24-27 October 2011

# Editorial

ITU/V. Martin

Geneva, 24-27 October 2011

## Social media: catalyst or curse?

Recent events have seen social media used as a tool for real-time reporting from earthquake zones and as a powerful catalyst for social transformation. But the speed and scale of online social media have proved difficult for authorities to match, whether in the Arab uprisings or in the recent riots in the United Kingdom. What lessons can be learned from recent events?

We share aspirations, so we need to look at what is at stake in the development of a broadband-enabled future.

## Digital cities

A conference on digital cities, as part of ITU Telecom World, will examine how information and communication technologies (ICT) can help meet new urban challenges. Our planet will soon be home to seven billion people. As cities demand more and more from our industry, and city dwellers account for half of the world's population, the time is right for key insights into the connected and digital future of urban life.

## Cutting edge technology

ITU Telecom World includes a forum for debates and knowledge sharing on hot topics such as the future Internet, spectrum management, smart living, cloud computing, social networks and privacy. And a technical symposium will examine in depth the technological developments that are defining and influencing the future of networks and services.

## Young people welcome

There is also a place for youth, with our Global Young Innovators and Digital Innovators competitions — and more than CHF 50 000 in prize money. Also, some 10 000 school-children from around the globe are invited to design the innovations that could make a real difference to their world.

Be part of this event to shape the ICT future.

# We've found ways to enrich life through communication.

Today, more than one third of the world's population uses Huawei's products and services. And they talk, write, laugh and love without a hitch because our constant innovation aims to keep people connected seamlessly anytime, anywhere, on any device.

www.huawei.com

HUAWEI


Cover photos: Shutterstock

ISSN 1020–4148
www.itu.int/itunews
10 issues per year


Editor-in-Chief: Patricia Lusweti
Art Editor: Christine Vanoli
Circulation Assistant: R. Soraya Abino-Quintana

Printed in Geneva by the ITU Printing and Dispatch Division. 

Editorial office/Advertising information:
Tel.: +41 22 730 5234/6303
Fax: +41 22 730 5935
E-mail: itunews@itu.int

Mailing address:
International Telecommunication Union
Place des Nations
CH–1211 Geneva 20 (Switzerland)

Subscriptions:
Tel.: +41 22 730 6303
Fax: +41 22 730 5935
E-mail: itunews@itu.int

# Living in a world of 7 billion people

## Digital cities for a better future

# Contents

Living in a world of 7 billion people



## *Sponsorship and support for ITU Telecom World 2011*

*ITU highly appreciates the sponsorship and support of the following companies:*

- *Huawei (page 3)*
- *China Mobile (page 19)*
- *UAE (page 27)*
- *Cisco (page 31)*
- *Alcatel-Lucent (page 51)*
- *AT&T (page 59)*

ITU TELECOM WORLD '11
Geneva, 24-27 October 2011







*Dr Hamadoun I. Touré*

*Secretary-General of ITU*

*Houlin Zhao*

*Deputy Secretary-General of ITU*


*Malcolm Johnson*

*Director of the ITU Telecommunication Standardization Bureau*


*François Rancy*

*Director of the ITU Radiocommunication Bureau*

*Brahima Sanou*

*Director of the ITU Telecommunication Development Bureau*

# Galaxy of world leaders to participate in ITU Telecom World 2011

With an agenda covering the major global landscape of information and communication technologies (ICT), the ITU Telecom World 2011 event, to be held in Geneva from 24 to 27 October, will bring together Heads of State and Government, ICT ministers and regulators, global business leaders and young innovators for a series of dynamic debates led by some of the industry's biggest names.

Participants will have the chance to hear from leaders of global technology and telecommunication companies from around the world, including Alcatel Lucent, AT&T, China Mobile, Du, Ericsson, Etisalat, Fujitsu, Huawei, Intel, KDDI, Microsoft, NTT Corporation, NTT DoCoMo, Q-Tel, Swisscom, Telkom SA, Türk Telekom, Verizon, ZTE, China Potevio, Cisco, Datang, Fiberhome, RIM, Satorys, Swisscom, and Telkom SA.

## Broadband Leadership Summit

The event will kick off with a Broadband Leadership Summit featuring Heads of State, Heads of Government and ICT ministers, who will join luminaries including Mexico's Carlos Slim; Neelie Kroes, Vice-President of the European Commission; Angel Gurría, Secretary-General of the Organisation for Economic Co-operation and Development (OECD); Irina Bokova, Director-General of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and many commissioners of the ITU/UNESCO Broadband Commission for Digital Development.

ITU TELECOM WORLD '11

Geneva, 24-27 October 2011

## The Internet of the future

Internet pioneer Robert E. Kahn will join Web 2.0 innovators such as Juliana Rotich, Chief Executive Officer of Ushahidi, in sessions dealing with topics such as the power of social media and the Internet of the future. The Director-General of WIPO, Francis Gurry, will lead a debate on the evolution of frameworks for intellectual property and convergence of online content.

## Development via ICT

In the development sphere, the strong mix of speakers, including Dr Margaret Chan, Director-General of the World Health Organization; Dr Babatunde Osotimehin, Executive Director of the United Nations Population Fund; Doyle Gallegos, Global Practice Leader, Connectivity Infrastructure at the World Bank; and Professor Jeffrey Sachs, Special Adviser to the United Nations Secretary-General for the Millennium Development Goals; shows that ICT access has become central to development across a whole range of spheres.

## Roll-out of networks and services

The vital role played by the public sector in driving the roll-out of networks and services will be highlighted by prominent experts including Jasna Matiæ, Serbia's State Secretary for Digital Agenda; Omobola Johnson, Nigeria's Minister of Communications Technology; and Phil Laven, Chairman, Digital Video Broadcasting, European Broadcasting Union.

## National and thematic pavilions

The event also features more than 25 national pavilions, including those of Algeria, Angola, Argentina, Azerbaijan, Belarus, Burundi, China, Czech Republic, Ghana, Japan, Kenya, the Republic of Korea, Malawi, Malaysia, Namibia, Nigeria, Poland, Rwanda, South Africa, Spain, Switzerland, Tanzania, Uganda and Zambia.

There will also be thematic pavilions, showcasing cutting-edge services, devices and applications in domains such as smart living, health and education.

## Digital Cities'11 Conference at ITU Telecom World 2011

In a world where spiralling population growth is stretching urban infrastructure to near-breaking point, can technology solve the growing challenges facing city planners and improve the lives of urban dwellers? (See articles on pages 12–30.)

The Digital Cities'11 Conference at ITU Telecom World 2011 will focus on the trends shaping global city development, and ask city mayors, leading urban developers and experts in the provision of essential public services for their views on the opportunities and solutions offered by ICT.

The conference, supported by Alcatel-Lucent, will focus on how the public and private sectors can come together to design and develop the next generation of urban living. Participants will also address connected urban development and how next-generation networks can enhance socio-economic development, increase the health and well-being of urban citizens and enable environmental sustainability.

ITU TELECOM WORLD '11

Geneva, 24-27 October 2011

Panel discussions and workshops will include mayors from the world's major cities, together with digital innovators, utility experts, industry leaders, and city planning and transport specialists. Top-level speakers and participants include: Gabrielle Gauthey (Executive Vice-President, Public Affairs, Alcatel-Lucent), Kim Seang-tae (President, National Information Society Agency, Advisor to the President of the Republic of Korea), Wim Elfrink (Chief Globalization Officer, Cisco), Suvi Lindén (former Minister of Communications, Finland, and Special Envoy to the Broadband Commission for Digital Development), Peter Pitsch (Director Communications Policy, Intel Corporation) and Juan Sabines Guerrero (Governor of Chiapas, Mexico).

## An open debate on urban digital development

"The Digital Cities Conference is specifically designed to be the focal point for informed and defining debate on the future of urban digital development… Given the pace at which people are embracing digital life, it is becoming ever more crucial that the industry connects and integrates city infrastructure and services with technologies that will help ensure the sustainability of cities, and improve life, work and well-being for their residents," commented Ben Verwaayen, Chief Executive Officer of Alcatel-Lucent.

Highlights of the Digital Cities'11 Conference include plenary sessions examining areas such as: collaboration in fostering sustainable, next-generation city life, and the need for cities to embrace new urban design, strong metropolitan governance, and innovative infrastructure investment models, and the best ways to optimize resources smartly, to increase quality of life for citizens. How can citizens become better involved in designing and scoping out the future of their own digital cities? Plenary debates will be followed by interactive discussion on topics such as: economics of sustainable cities; best broadband strategies; work-life innovations; public health and safety in a digital city.

Workshops will also look at ways forward in shaping the cities of the future, with outcomes clearly framed into actionable items, helping participants highlight the path to the future and challenging stakeholders to rethink near-future strategies on urban development.

The Forum agenda is available at: http://world2011.itu.int/sites/default/files/Event_Calendar.pdf


Shutterstock

# Greening ICT: ITU makes progress on minerals and batteries

ITU has underlined its key role in green information and communication technologies with a raft of agreements announced on 28 September 2011 by Study Group 5 of its Telecommunication Standardization Sector (ITU–T).

A meeting of the group in Seoul, Republic of Korea, agreed on a globally recognized set of methods to assess the environmental impact of ICT. The group also agreed to draft due diligence guidelines regarding the supply of conflict minerals, and to study environmental protection and recycling possibilities in regard to batteries for mobile phones and other ICT devices.

## How to measure emissions?

Estimates of how far the use of ICT can reduce global emissions — and estimates of the emissions generated by the ICT sector itself — vary widely because different measurement methods are applied. After the problem was raised by delegates at ITU's "ICT and Climate Change" symposium in 2008, ITU took on the challenge and has pioneered the adoption of a new globally agreed set of standards.

To ensure consistency between different approaches, the new methodology has been developed in cooperation with other standardization organizations such as ISO, IEC, ETSI and ATIS. The methodology is also aligned with the Digital Agenda of the European Commission. Dr Hamadoun Touré, ITU Secretary-General, said "This methodology has been developed by ITU's industry members. This will be important in ensuring it gains wide acceptance by the world's ICT industry. An internationally agreed methodology means estimates of the impact of ICT on greenhouse gas emissions and energy consumption will now have much greater credibility. It

will also show just how significant a contribution ICT can make by reducing global emissions in other sectors."

Neelie Kroes, Vice President of the European Commission said "I'm pleased that the industry is taking the task of measuring its own footprint so seriously. And I'm pleased that ITU, as a UN agency, is doing such good work facilitating negotiations, reaching out globally to industry sub-sectors and to other standardization initiatives."

## New guidelines on conflict minerals

Further ITU work on conflict minerals will begin in response to a request from the Democratic Republic of Congo. ITU will make a survey of existing due diligence requirements and guidelines concerning sources of conflict minerals (in particular, those that are smelted into tin, tantalum, tungsten and gold), as well as their use in conformity with recognized international treaties and national legislation, where these exist.

Rare minerals are used in consumer electronics products such as mobile phones, DVD players, video games and computers. Agreement to address the use of these precious resources demonstrates the ICT industry's commitment to sustainability at all levels of the value chain.

## Standardized batteries

Following on from the success of ITU's Universal Charging Solution for mobile devices (Recommendation ITU–T L.1000), ITU–T Study Group 5 also agreed to study the benefits and disadvantages of the standardization of batteries for mobile terminals and other ICT devices. The group will look at energy efficiency over the battery life-cycle, battery lifetime and exchangeability, safety and environmental protection, and recycling and reuse. This could lead to a reduction in the amount of harmful materials used in batteries and an increased lifespan for ICT products. Battery manufacturers, device manufacturers, operators and users will all benefit, say experts.

## ITU–T Study Group 5 delivers the goods

Ahmed Zeddam, Chairman of ITU–T Study Group 5, said "This has been the most productive and significant meeting in the long history of Study Group 5. Twelve new important standards have been agreed, including many critical to methodologies to assess the environmental impact of ICT and the protection of home networks and next generation network (NGN) equipment from electromagnetic compatibility (EMC) and environmental effects. The meeting also saw revisions to a key set of standards on resistibility to overvoltages or overcurrents of telecomunication equipment. ITU is the only organization producing these important global standards."


# South Sudan joins ITU as its 193rd Member State

South Sudan, has joined ITU to become the Union's 193rd Member State, effective from 3 October 2011. The country, which gained its independence on 9 July 2011, has already been allocated the international dialling code +211 by ITU, following the country's recognition by the United Nations General Assembly. The dialling code became active on 28 September 2011.

"We are delighted to be able to welcome South Sudan as an ITU Member State so soon after it attained full nationhood. The Government of South Sudan clearly recognizes the importance of information and communication technologies as an engine of social and economic development. We will work alongside the national authorities to leverage the power of technology, to help lift the country to new levels and fulfil the national motto of 'Justice, Liberty, Prosperity'," said ITU Secretary-General Dr Hamadoun Touré.

The accession of South Sudan as an ITU Member State implies its adhesion to the Radio Regulations, the international treaty which governs the use of radiocommunications among the world's nations. The Radio Regulations give South Sudan full access rights to the frequency spectrum and satellite orbit resources managed by ITU.

A high-level ITU delegation led by Brahima Sanou, Director of ITU's Telecommunication Development Bureau, recently met government ministers in South Sudan with the aim of acquiring first-hand information on the country's needs and challenges in the area of ICT development. This first visit by ITU paves the way for the delivery of focused assistance to the country as it embarks on its development path.

# Digital cities

Shutterstock

# What is a digital city?

*A truly digital city will have the following characteristics:*

- *Broadband connectivity: for digital cities, broadband is a utility that is as vital as clean water and good roads. Digital cities have a clear vision of their broadband future and implement policies to encourage its deployment and adoption.*
- *Digital inclusion: smart cities promote digital inclusion by providing "have-nots" with access to digital technology and broadband, enabling skills training and access to government and commercial services.*
- *Innovation: in smart cities, companies use broadband to innovate, creating jobs and reducing costs, while delivering services anywhere and anytime.*
- *Knowledge workforce: recognizing that knowledge workers create economic value, digital cities will use ICT to support education and training in order to develop a skilled workforce.*


AFP/AltoPress

# Living in a world of 7 billion people

## Digital cities for a better future

*The world's population is projected to reach 7 billion on 31 October 2011, according to the United Nations. As the global population heads towards this milestone, we are discovering that more people want an urban life than our economies and the environment can sustain. What can we do? One answer is to use information and communication technologies (ICT), because ICT can support a more sustainable approach to designing, building and managing cities.*

### Urban growth and service needs

By 2010, for the first time in history, more than half the global population were living in urban areas. This trend towards urban migration will continue, and the United Nations estimates that, by 2050, almost 70 per cent of humanity will live in cities.

But rapid urbanization is putting an ever-increasing strain on cities' ability to provide their citizens with essential municipal services such as health care, transport, education, public safety, housing and water. Low-income citizens have poor access to services, and as populations grow, that access becomes even more difficult. The figures make grim reading: there are 828 million slum dwellers globally, and 2.6 billion people do not have adequate sanitation. If the trend continues, that number could grow to 2.7 billion by 2015, according to "The Millennium Development Goals Report 2010".

## Keeping pace and being green

The growing number of city dwellers, especially in the least developed countries, has trapped city governments in a vicious circle. Urban authorities are unable to improve access to services fast enough to keep pace with rapid population growth.

The huge urban population needs access to services, and those services must be delivered in a sustainable fashion. The challenge of increased access to better urban services is exacerbated by climate change. Cities are responsible for 70 per cent of global emissions of greenhouse gases, and so there is a pressing need for urban authorities to find new ways to deliver services while protecting the environment.

## Can ICT help cities face the challenges?

Technological progress, especially advances in ICT, is often trumpeted as the key to improving urban services. Clearly, technology can play an important role, but not everyone is ready to jump on the bandwagon.

Certainly, ICT is integral to the building and operation of new smart cities. ICT can help to realize developers' dreams of a city with no traffic jams, where residential energy controls can be managed from a smartphone, and where "green meters" allow residents to track their daily energy consumption. Two cities of the future illustrate the potential of ICT: Songdo in the Republic of Korea and Masdar in Abu Dhabi.

Songdo city is scheduled to be completed in 2015. All apartments will have high-definition video conferencing facilities. This will enable, for example, travel-free consultations with hospitals, and applications for council permits to be made from home. Buildings will have ICT-led management systems for energy efficiency, and pneumatic waste disposal systems will avoid the need for lorries to remove household waste.

Masdar city in Abu Dhabi aims to be the world's first zero-carbon city, and is expected to be completed around 2022. There will be no petrol-engine cars within the city. Instead, futuristic computer-controlled pods will ferry residents around.

*The city of Songdo, Republic of Korea is scheduled to be completed in 2015*

*Flikr/Kiva.Dang's*

As showcases for what ICT can do for smart cities of the future, Songdo and Masdar are laudable. But Songdo is projected to cost USD 40 billion for 65 000 full-time residents, and Masdar is expected to cost USD 22 billion for 50 000 residents. These sums of money are outside the budgetary reach of most governments. Songdo and Masdar may be research laboratories for smart cities, but they do little to help solve the challenges in existing cities with their so-called legacy systems.

In many cities that still rely on legacy systems, ICT are already being usefully employed to help in urban development. But ICT alone cannot solve every problem. For example, Google's technology is helping the United Nations agency UN-HABITAT to benchmark the activities of the water utility in Nairobi and assist in propoor investment. But the technology cannot remove the criminal gangs that illegally pipe water from the utility to sell to slum dwellers who have no choice but to buy water from the gangs at inflated prices.

Another example is IBM's Traffic Prediction Tool, which has resulted in great progress in Singapore in reducing congestion and controlling traffic flow. But in cities like São Paulo, where 77 per cent of greenhouse gas emissions come from traffic, IBM technology alone will not be enough to resolve the problem.

## Smart cities are informed cities

Cities do need to be smarter. And many cities are using ICT to help in the delivery of their services. But to tackle the challenges posed by increasing urbanization, cities must also be smarter in the traditional sense.

Cities can become smarter by learning from other cities. Where technology or education or innovative financing or a combination of some or all of these factors has helped a city to improve its service delivery, the message needs to be sent to other cities.

While there is no one-size-fits-all solution to delivering services to all the sectors of an urban population, more cities must make an active effort to share best practices and successes with others. At present, many best practices remain local knowledge, and are not even scaled up nationally. To benefit communities in other countries, best practices will need to be made known internationally.

## Information exchange and mentoring

To assist in knowledge exchange, city organizations have moved from exchanging information at conferences to launching formal mentoring schemes. United Cities and Local Governments, the largest global grouping of city leaders and local government leaders, has launched a mentoring programme which aims to go far beyond ceremonial twinning arrangements. The mentor city will actively assist the mentee city to transform its local government and its delivery of services.

As an example of activities under the United Cities and Local Governments programme, the city of Johannesburg in South Africa has mentored Lilongwe, the capital city of Malawi, through a city development strategy which formally began in 2010. The technical exchanges between civil servants in the two cities have been of real great value. Lilongwe has, for example, implemented debt recovery strategies and initiated a capital investment programme.

This sharing of know-how needs to be taken further, with cities also talking to private-sector companies from the ICT industry, so that they can be mentored on how to improve delivery of local services in a cost-effective manner.


## ICT tools for e-governance

Another way for cities to become smarter without investing great sums in new technologies is by using online tools to provide better services. For example, at the individual level, Internet sites can enable citizens to apply for licences or make community payments. At the governmental level, service delivery can be improved when civil servants are able to consult online and learn from the experience of other cities and countries.

The United Nations Department of Economic and Social Affairs has produced some tools to bring the benefits of e-governance to local governments though the United Nations Public Administration Network (UNPAN). The objective is to build the capacity of regional and national institutions so that they can process and disseminate information by means of up-to-date ICT. The overall aim is to promote better public administration.

A specific portal, the UN Public Administration Country Studies (UNPACS), will allow city and local governments to: consult codes of conduct for civil servants; review freedom of information and data protection acts; and examine e-government strategies, including citizen engagement. UNPACS will become the main global repository for such information, which — when combined with practical experience — can assist in policy-making and problem solving.

## ICT in urban management

ICT have an increasingly important role to play in the development of existing cities through management systems and the dissemination of information. Even more strikingly, ICT have an essential role at the heart of the planning of new cities that are being built from the ground up. The critical challenges of climate change and the achievement of the Millennium Development Goals need to be tackled in cities, and all ITU members need to be part of the growing dialogue.

Cities need to be heard, especially those in developing countries. This will help create new partnerships to educate, mentor and inform cities before they embark on acquiring new technologies. A win-win result will be achieved when ICT providers can meet the policy objectives set by a city for delivering services to its citizens.

United Nations Secretary-General Ban Ki-moon with the Executive Director of the United Nations Population Fund Babatunde Osotimehin at the launch of the "7 Billion Actions" Initiative, New York, 14 September 2011

UN Photo/Paulo Filgueiras

## 7 Billion Actions

*On 14 September 2011, the United Nations launched a global initiative — 7 Billion Actions — bringing together governments, businesses, the media and individuals to address the challenges and opportunities of a world of 7 billion people — a milestone expected to be reached on 31 October 2011.*

*"We are not here simply to acknowledge that milestone. We are here to address all of its vast implications," United Nations Secretary-General Ban Ki-moon told a panel discussion at the launch ceremony at UN Headquarters in New York.*

*"The seven billionth citizen will be born into a world of contradictions. We have plenty of food yet millions are still starving. We see luxurious lifestyles yet millions are impoverished. We have great opportunities for progress but also great obstacles."*

*Among challenges beyond grinding poverty and inequality, Mr Ban cited discrimination, human rights abuses, lack of democracy, violence against women, maternal mortality, climate change and the degradation of the environment. "These are all the challenges that we can and must overcome," he said. "If we invest in people, we will reap the best dividends."*

*The United Nations Population Fund (UNFPA), the agency responsible for "7 Billion Actions", noted the implications of the new milestone for sustainability, urbanization and migration in a world where conflicts and weather disasters are driving people from their homes and climate change is exacerbating food and water shortages.*

*At the same time, new media technology is enabling direct communications between people around the world, creating an unprecedented opportunity to build greater communities and share ideas across borders.*

中国移动通信

CHINA MOBILE

AFP/Comstock Images

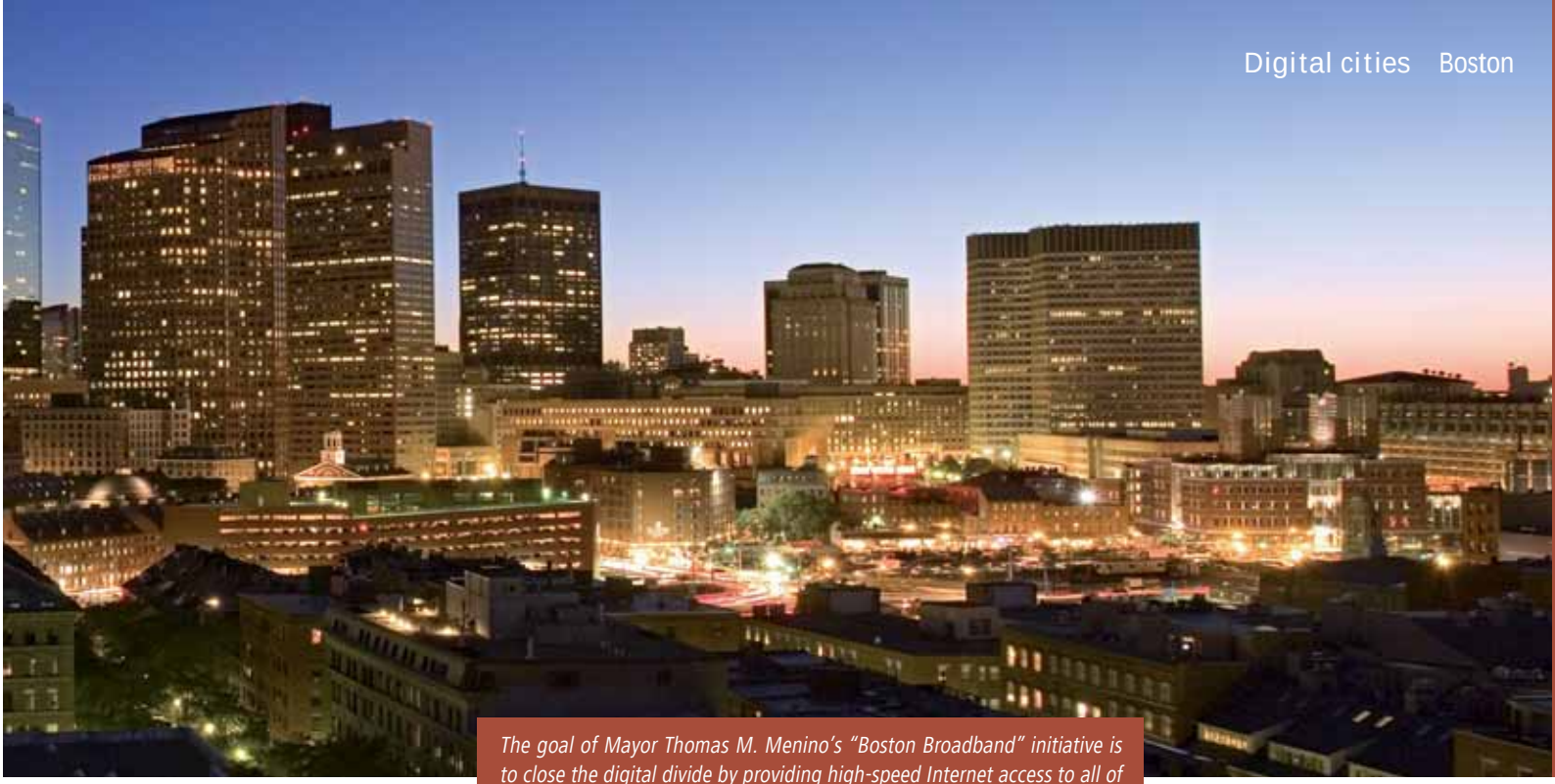
# Boston named leading digital city in the United States

*Whether it is an app to report damaged or missing road signs, or using mobile phones to connect students with youth opportunities, Boston, Massachusetts is advancing faster than most cities. Here we look at how Boston has become America's number one digital city. This rating was given by the Center for Digital Government's 10th Annual Digital Cities Survey. The survey looks at cities that successfully utilize technology to better conduct government and serve constituents. Having already won the award for the best government website in the United States a few months before, Boston became the first city to win both awards in the same year.*

Over the past 18 months the City of Boston has made significant technological advances benefiting businesses, residents and visitors. Following on from the success of the city's first iPhone application called Citizens Connect, the capital of Massachusetts then created a mobile version of the city website, an inexpensive mobile site that they believe will put the city in a better position to communicate with citizens now and in the future.

"As more people use mobile devices to access news and information, having a mobile site for the City of Boston is essential to providing services to our citizens," said Mayor Thomas M. Menino. "This is again further proof of our constant push for innovation and use of modern technology."

The design emphasizes a very functional method of accessing information based on user, device and content metrics. The new site provides mobile phone users with quick and easy access to the information they want most. Users are able to file a taxi complaint or lost property report immediately after stepping out of the cab, locate a towed car while standing in the location it was towed from, view election results as they come in, find something to do while out and about, and get visitor information.



*The goal of Mayor Thomas M. Menino's "Boston Broadband" initiative is to close the digital divide by providing high-speed Internet access to all of Boston's neighbourhoods and communities*

The mobile website, like the mobile phone application, is part of the city's strategy to enable "anytime, anywhere" service to residents. Since its launch, Boston's award-winning Citizens Connect mobile phone application has continued to evolve. The app enables residents and visitors to report problems (such as potholes or defective street lighting) directly from their iPhones to city departments for resolution. One of the most recent additions is a new feature that allows citizens to easily report missing or damaged street signs, allowing the local government to more efficiently respond to constituent requests for replacements.

"The Boston Transportation Department welcomes the assistance of those we serve in helping us locate damaged signs on our streets," said Boston Transportation Commissioner Thomas J. Tinlin. "Our constituents act as valuable eyes and ears in our city and this tool will help us to improve our efficiency and the appearance of our streets." The new feature adds a button to the menu of types of service requests to include reporting on missing or damaged signs.

"We continue to look for new ways to use technology to make government even more accessible and more responsive to our constituents," said Mayor Menino. "Citizens Connect has been a valuable tool for the City and this new feature will allow us to more effectively monitor and respond to these issues."

## Awards recognize Boston's success

As well as the iPhone application, over the past two years Boston has also launched the Geographic Information System (GIS) Data Hub, introduced innovative e-alerts, and engaged constituents through social media outlets.

"The City of Boston is home to a diverse, digital savvy population," said Bill Oates, the City's Chief Information Officer. "It was imperative to provide relevant content and services on smartphones for both our constituents and visitors."

The technological advances that Boston has been making have certainly not gone unnoticed, receiving numerous awards in many different areas. The city was awarded first place by the Center for Digital Government in the 2010 Best of the Web Awards, an annual awards programme that recognizes the most innovative, user-friendly state and local government portals.

Probably the most significant award was being named the most advanced digital city in the United States according to the Center for Digital Government's 10th Annual Digital Cities Survey. The survey recognizes municipalities that successfully use technology to better serve constituents and conduct government operations. Having already won the award for the best government website a few months before, Boston became the first city to win both awards in the same year.

"The winners continue to demonstrate the transformative power of information technology," said Digital Communities Director Todd Sander. "Economic conditions are bringing about a fundamental rethinking of local government structures and support strategies. It is clear from the results that digital technology is a critical factor in helping organizations not only maintain, but actually improve service delivery when faced with fewer employees and smaller budgets."

Despite receiving many awards recognizing the advances that have been made, Boston has not stopped there but continues to use technology to improve services and the quality of living for its residents.

## Bringing broadband to all citizens

With the help of a USD 4.3 million grant from the National Telecommunications and Information Administration (NTIA), the city has invested heavily in a programme giving training, computers and opportunity to underserved communities. The money has funded three in-depth programmes that provide training in how using high-speed Internet broadband can improve lives and enhance job prospects.

As part of Mayor Menino's "Boston Broadband" initiative, which aims to close the digital divide by providing high-speed Internet access to all of Boston's neighbourhoods and communities, these programmes have been offered in schools, public libraries, Boston Centers for Youth and Families, Housing Authority computer labs and the Timothy Smith Network Community Centers, as well as in housing for the elderly.

"I am proud to say this grant is proof that Boston, by thinking outside of the box, truly leads the way in securing vital computer broadband access and training for those that are underserved and arguably need it the most," said Mayor Menino. "This funding provided a host of crucial programmes not only in the area of job training, Internet training for schoolchildren and families, but also for seniors who can use this technology to stay in touch with loved ones and care providers."

The first of the initiatives that benefitted from the funding was a family broadband programme called Technology Goes Home (TGH). The programme expanded its unique life-relevance curriculum by providing training and netbooks to 5800 students and parents, doubling the school-based TGH enrolment and extending into the newly NTIA-funded Public Computing Centers to train an additional 1500.

Another programme to receive investment was the Connected Living (CL), a broadband life-relevance project based in established housing for the elderly. CL worked with the Boston Housing Authority directly in three communities for the elderly to achieve high rates of broadband adoption. The programme aimed to strengthen each senior citizen's connections with family, friends and service providers, and enhance independence, socialization and cognitive abilities. The project also provided computers for elderly people to use in their apartments.

The final initiative to benefit was the On Line Learning Readiness programme. The project looked to enrol 800 out-of work adults in an in-depth training programme to provide digital workplace skills. The training took place at Timothy Smith Network centres. Graduates received assistance in acquiring a job and a netbook computer to continue learning at home.

"This grant is a big deal for Boston," said Senator John Kerry, when it was announced. "It will benefit workers hunting for jobs, students, and seniors who might not otherwise have broadband access. I was proud to fight for this funding knowing what a difference it can make."

Boston continues to lead the way in technology advances and innovation, improving the efficiency of local government and the quality of life of its citizens. Applications such as the Citizens Connect mobile application has made government more accessible, transparent and responsive, while great strides are being made in providing technology tools and training to underserved communities. Boston is an example to cities, not just in the United States, but also across the world, of how bridging the digital divide and using innovative new technologies can improve urban living.


Philips Communications

*Philips Innovation Experience 2011, Evoluon, Eindhoven*

# Eindhoven and the Brainport partnership

## An open innovation model

*With a workforce of just 400 000 and 730 000 inhabitants, Eindhoven, occupying a small area south of Amsterdam in the Netherlands, is a very successful place. The region has long been the industrial centre of the Netherlands, and has now been named Intelligent Community of the Year 2011 by the Intelligent Community Forum, a United States think-tank, largely thanks to a public-private partnership called Brainport Development.*

Mayor of Eindhoven, Rob van Gijzel, and Yvonne van Mierlo, Councillor for Economic Affairs of Helmond, a city near Eindhoven, received the Intelligent Community Forum award in New York in June 2011. Mr Gijzel said "We can be proud of our performance. The title gives us an enormous boost to get Brainport Eindhoven even more established on the national and international stage."

Co-founder of the Intelligent Community Forum, Louis A. Zacharilla, presented the award to Eindhoven, which succeeded Suwon, Republic of Korea, the winner of 2010. The awards are presented by the independent think-tank as part of its annual summit, "Building the Broadband Economy". In selecting candidates to be considered for the title Intelligent Community of the Year, the Forum annually assesses 300 regions or cities on the basis of their success in realizing innovative, socially relevant broadband and information and communication technology (ICT) applications on a broad scale.

The Intelligent Community Forum recognizes the intelligent community as the most compelling model of best practice in economic and community development worldwide. An intelligent urban community is the human asset of a digital city that deploys broadband, creates and sustains a knowledge-based workforce,

offers digital inclusion, innovates, and markets and advocates its success.

## How will Eindhoven sustain this success?

The Eindhoven region generates EUR 24 billion in gross domestic product and EUR 55 billion in exports, one quarter of the Dutch total. It absorbs 36 per cent of all private Dutch research and development spending and is home to globally recognized companies including Philips, the healthcare, lighting and consumer product business; and ASML, which makes photolithography equipment for the production of silicon chips. The Eindhoven University of Technology, with more than 7000 students, is considered one of the top three research universities in Europe, and the High Tech Campus Eindhoven, which was founded by Philips, houses more than 80 companies employing 7000 residents.

To sustain this success is a challenge. Eindhoven is a manufacturing region in a high-cost country. By focusing on producing high-value, technology-based products, it is in competition with fast-growing manufacturing centres in other countries, which can operate at much lower cost. Many such countries are striving to perfect the complex manufacturing capabilities that have made Eindhoven successful, which creates unceasing pressure for the Eindhoven region to boost its productivity.

At the same time, Eindhoven is saddled with Europe's demographics, in which a low birth rate and an aging population are reducing the regional workforce. To win the battle for the talent that provides its competitive advantage, the region must make itself economically and socially attractive to knowledge workers from around the world.

Foreign competitors are also seeking to raise their own game in research and development, and the Eindhoven region, which generates 50 per cent of all Dutch patents, is under pressure to stay ahead of the curve.

## The Brainport model

Eindhoven's answer to these challenges is a public-private partnership called Brainport Development. Its members include employers, research institutes, the Chamber of Commerce, leading universities and the governments of the region's three largest cities. A small professional staff meets regularly with stakeholders to identify their strengths, needs and objectives, then looks for opportunities for them to collaborate to achieve business, social or cultural goals. Any stakeholder of Brainport has the opportunity to create new initiatives or partner with other stakeholders. Their work is based on a strategic plan called Brainport Navigator 2013 (with a 2020 version in the works, funded in part by the Dutch government) which calls for a focus on five key areas for development: life technologies, automotive technologies, high-tech systems, design, and food and nutrition.

It sounds simple enough, and not much different from strategies and collaborative groups at work in cities and regions around the globe. It could even be derided as a "talking shop" in which endless meetings take the place of action. But that would be a mistake. Take health care. The region already has some 825 businesses active in the health sector, employing 17 000 people. To drive further growth, Brainport has created a project called Brainport Health Innovation, with the goals of increasing the well-being of the elderly and chronically ill, reducing healthcare costs and increasing productivity, all the while generating economic opportunities for the region.

Brainport Health Innovation has brought together hospitals, insurance companies, technology manufacturers, local government and individual patients to design and implement realistic technologies in a way that offers a profitable operating model. One example is the Living Lab eHealth project, in which aging people test new services and products introduced by the Brainport Health Innovation participants, including remote monitoring and diagnosis over broadband.

Another project, Care Circles, aims to more efficiently share capacity among providers of home care for the elderly and people with disabilities. The longer such patients can be cared for at home, the happier they generally are and the lower the costs of their care. The night-time hours represent the biggest challenge to home care. Through Care Circles, all calls go to a central dispatcher, which matches the location to the partner organization closest to the patient. The result is better quality and availability of care at a lower total cost.

Health care in the Eindhoven region faces a rise in costs from EUR 17 billion to EUR 25 billion by 2020, in large part because of the need for 100 000 new healthcare workers. Brainport Health Innovation is tackling this by seeking to improve productivity by 1 per cent per year, which would reduce demand for new personnel by 25 000 and save about EUR 750 million. At the same time, Brainport Health Innovation's new projects are expected to produce 150 new companies employing at least 10 000 people. So by reducing employment demand in one area and increasing it in another, the region as a whole can benefit.

*Downtown Eindhoven at night*

Shutterstock

## Track record in collaboration

Brainport has a wide range of projects. In the area of education, Brainport was behind a scheme that provides more than 800 Dutch primary schools with a combination of hardware and software to simplify the integration of information technology into education.

Paradigit, a systems integrator founded in a university dormitory and a member of Brainport, provides laptops to schools incorporating its SKOOL software. When students start up the laptops for the first time, the systems automatically connect to the SKOOL server, download all of the applications specified for that school and configure themselves. SKOOL provides remote management of all servers and personal computers at its client schools, as well as an online interface for students and teachers to communicate and share content securely. So reliable and robust are the hardware and software that SKOOL's technical support department consists of just three people.

Some partnering, some pre-commercial testing, some cost-sharing — at first glance, the Brainport Health Innovation model sounds worthy but hardly revolutionary. But that is the Brainport method. Bring together the players from business, government, institutions and citizens groups. Figure out specific projects on which they can cooperate for clear mutual benefit. Then manage the projects carefully until they produce results and gain the ability to become self-sustaining.

## The enabling infrastructure

The most long-standing innovation projects of Brainport and Eindhoven concern broadband. From 1999 to 2005, the Dutch government funded a pilot programme called Kenniswijk (Knowledge City) to subsidize installation of fibre optics to the home. The programme ended after connecting 15 000 homes, but it was followed by a classic Brainport project, Be-linked, which brought together companies, institutions, social organizations, governments and residents to promote broadband deployment and applications.

Over the years, Be-linked has stimulated a remarkable range of activity. A commercial provider, Reggefiber, has greatly expanded its services in municipalities, where at least 40 per cent of residents are now using the service, which serves more than 230 000 households. Eight industrial parks, backed by loan guarantees from the city of Eindhoven, have also installed their own fibre networks, and the city of Eindhoven has offered its more than 100 schools access to a broadband fibre network at low-fixed costs, as well as help in using the network to streamline management processes and improve teaching outcomes.

## Open innovation

In another innovative example of promoting connectivity, two residents from the small village of Nuenen successfully lobbied the Dutch government to extend deployment of a fibre network through a cooperative ownership model. Property owners were asked to pay for the "last-mile" connection from the core network into their buildings. The case for citizens to put in their own money was simple: they were investing in a home improvement that would increase the value of their property.

The network, OnsNet, achieved a 97 per cent penetration within three months of start-up. As 95 per cent owners of OnsNet, Nuenen's citizens join technical and operational executives at meetings to identify new ideas and solve problems. Other innovations have followed.

A "Window on Nuenen" channel provides access to video cameras strategically positioned around town. This allows housebound elderly people to stay connected to the life of the community. The OnsNet community television service trains locals in the use of video equipment and makes it simple to upload video clips, allowing clubs and societies to post videos of their meetings and events. OnsNet is an example of something Brainport calls "open innovation."

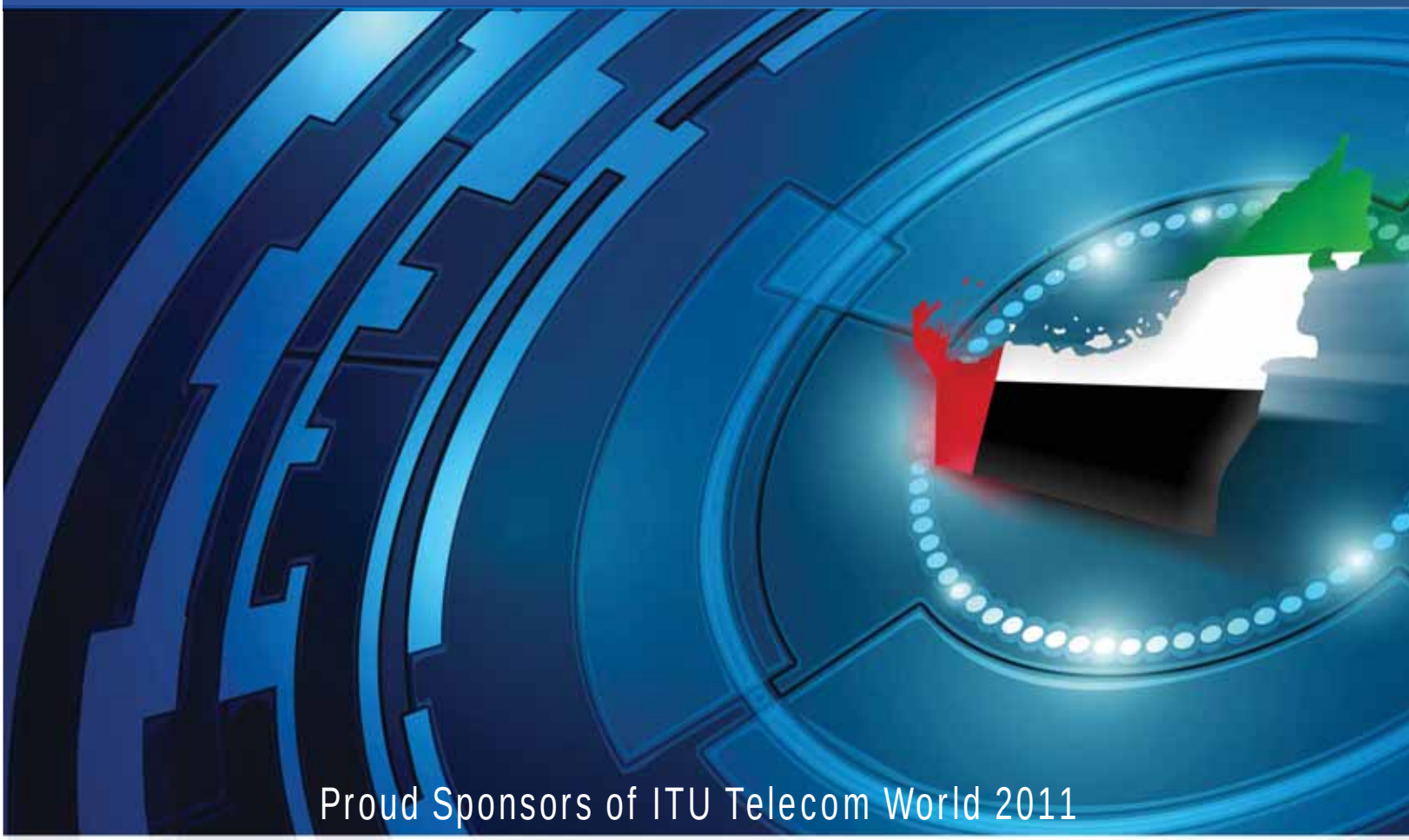
Brainport calls itself an open innovation platform, in which many players pursue their own interests in collaboration with others, with Brainport acting as instigator, facilitator, negotiator and referee.

The model is simple to explain in theory, but hard to carry out in practice. World markets are changing fast and demographics are presenting challenges to growth all around the globe. The hope of the Eindhoven region is that years of practising open innovation, on a foundation of ICT will provide an advantage that competitors will find hard to match.

*Source: "The Top Seven Intelligent Communities of 2011: Health in the Intelligent Community", published on 1 June 2011 by the Intelligent Community Forum.*

# United Arab Emirates

## Committed to International Cooperation in the field of ICT



Proud Sponsors of ITU Telecom World 2011

du
وتحيا بها الحياة
add life to life

هيئة تنظيم الاتصالات TRA
Telecommunications Regulatory Authority

etisalat

Shutterstock

# Shanghai's connectivity for residents, businesses and visitors

*At the start of 2002, the Shanghai Municipal Government announced a strategy to develop Shanghai as a digital city. The plan, Digital city Shanghai, was to develop an integrated information and services platform to meet the needs of residents, visitors and businesses. Ten years later, and the city has begun to tackle one of the biggest challenges to the full realization of this goal — increasing Shanghai's Internet connection speed.*

The Shanghai branch of China Telecom has revealed a plan to upgrade its broadband to offer the fastest connection speed nationwide by the end of 2012. The company is also offering the facility for users to test their connection speed online. Shanghai's users, who receive Internet from China Telecom have now been promised free network upgrades or a reduction in monthly fees for slow connections.

A citywide mobile broadband network with more base stations for third-generation (3G) mobile and a next-generation broadcasting network will also be available by 2012. And Shanghai is one of 12 cities testing three-network convergence (of Internet, television and mobile networks). The next-generation broadcasting network is based on digital cable television and mobile broadcasting technology, and aims to offer 30 Mbit/s bandwidth access for each subscriber.

China Mobile, which provided telecommunication services to World Expo Shanghai 2010, has established a TD-LTE demonstration network in that city. Li Yue, Chief Executive Officer, Executive Director and President of China Mobile Communications Corporation, China Mobile Limited, described how a full-coverage wireless network in Shanghai World Expo Park had brought convenience to millions of visitors. "This means that it is not an impossible dream to easily access the wireless network anywhere and anytime in the future city," he told participants in the

"Information Industry and Digital City Forum", during World Expo Shanghai 2010.

After the World Expo, China Mobile promised to promote "wireless city" construction nationwide. The company plans to make "wireless city" the fifth public infrastructure after water, electricity, gas and transport, and an important window for the functions of government services, which will benefit industrial development and people's lives.

At the end of 2010, the company kicked off preparations for large scale TD-LTE trials in six cities, namely Shanghai, Hangzhou, Nanjing, Guangzhou, Shenzhen and Xiamen and construction of a demonstration network in Beijing.

In September 2011, Alcatel-Lucent and China Mobile took another major step towards delivering superfast mobile broadband services to customers in China with the completion of the first stage of testing on the China Ministry of Industry and Information Technology (MIIT) and China Mobile's TD-LTE trial network in Shanghai.

The trial network provides coverage to an area of Shanghai including the financial district of Lujiazui and the high-tech business park of Zhangjiang. Alcatel-Lucent's completion of testing paves the way towards the realization of the goals of China Mobile and the Shanghai Government of establishing a "Smart City Demonstration Zone". In those pilot areas, Alcatel-Lucent is providing high-definition video-conferencing, high-speed transfer of files and access to leisure applications such as 3D gaming.

The trial network in shanghai is part of a broader programme established by MIIT and China Mobile to demonstrate how the quality and speed achieved during the field trial enabled by TD-LTE technology can address the rapidly growing demand for mobile broadband. Some of the benefits were demonstrated at the end of August 2011 when Alcatel-Lucent made the first trans-Pacific video call using new "light radio" technology. During the call, the video was transmitted to one of the participants travelling in an LTE-connected van around Shanghai using the TD-LTE trial network.

## What is "Digital City Shanghai"?

Digital City Shanghai consists of five parts: digital government, digital enterprise, distance shopping, distance education and digital community. Online shopping, education and community networks are self-explanatory. According to the 2005 report *Digital City Shanghai: Concepts, Foundations, and Current State,* digital government is the organizer and manager of Digital City Shanghai, using information and communication technologies (ICT) to reform the government's organization and general workflow.

Digital enterprises enable factories and companies to integrate their information in several key tasks, such as feasibility studies, production design, material purchase, management, quality control, and sales.

The projects in Digital City Shanghai can be divided into four main areas: spatial data infrastructure, city informatization, Shanghai city grid, and Shanghai logistics information platform.

The framework of the Digital City Shanghai project includes the development of application systems for telemedicine, e-commerce, e-government, distance learning and city management.

Telemedicine is a developing sector, offering health consultations and diagnoses to remote users who live far from medical facilities. The authors of *Digital City Shanghai: Concepts, Foundations, and Current State* explain how the Shanghai health consultation network uses Internet technology to bring doctors in hospitals together to cover more areas and provide more medical services to citizens. The facility is now operational across more than 20 provinces.

AFP/Imaginechina

"In recent years, telemedicine in China has developed quickly with the rapid growth of telecommunication networks," stated Zhelong Wang and Hong Gu from Dalian University of Technology in the *Online Journal of Space Communication.* China's major telemedicine networks now include the Golden Health Network.

Telemedicine has great potential for growth, because medical centres still need more managers with sufficient information technology knowledge to make full use of the system, and there is a further need to employ skilled workers to oversee the management and maintenance of the network.

## ICT as a tool for smart economic growth

The China Internet Network Information Centre reports that Shanghai now has 420 million Internet users, 364 million broadband users, 11.21 million domain names, 250 million IPv4 addresses, 2.79 million websites and an international bandwidth of 998 217 Mbit/s.

Shanghai's rich knowledge assets, competitive market, and existing IT clusters have enticed more than 30 large multinationals to locate research and development centres there. The centres are producing new spin-off companies and new university-business research ventures, and boosting the skill levels of Chinese engineers and researchers.

Testament to Shanghai's commitment to developing ICT is the fact that it recently hosted its third training programme designed to teach cities worldwide how ICT services can help to build smart cities. The programme was run by the United Nations Institute for Training and Research (UNITAR) in partnership with the Ministry of Commerce, the Ministry of Industry and Information Technology, and the Ministry of Foreign Affairs. One topic on the 20-day course agenda was the development of integrated ICT services in Shanghai and how the upscaling of the city's digital technology has created exponential economic growth benefits.

As Shanghai moves to improve Internet speeds, the future for the formation of a truly digital city looks promising. Citizens already have access to myriad e-services and applications to assist them in their daily lives. And the existing information technology knowledge in the city has already attracted the establishment of new research and development centres. The plans for ICT development and an integrated services platform can now be realized through the upgraded infrastructure. This will make Shanghai's digital dream a reality.


cities & citizens together
Visit the Cisco stand 5051 at ITU Telecom World 2011
it's where the concept of community is reborn.
it's where any town can achieve economic, social and environmental sustainability, pioneering the future of urban life for all our cities, both old and new.
it's where access to new services, based on the network as the platform, and using real-time information and analytics, helps every citizen live a healthier, greener and better life...together through Smart+Connected Communities.
changing a community, a country, the world.
together we are the human network.
cisco
join us | cisco.com/go/smartconnectedcommunities
© 2011 Cisco and/or it's affiliates. All rights reserved.

# The Millennium Villages and ICT for Development

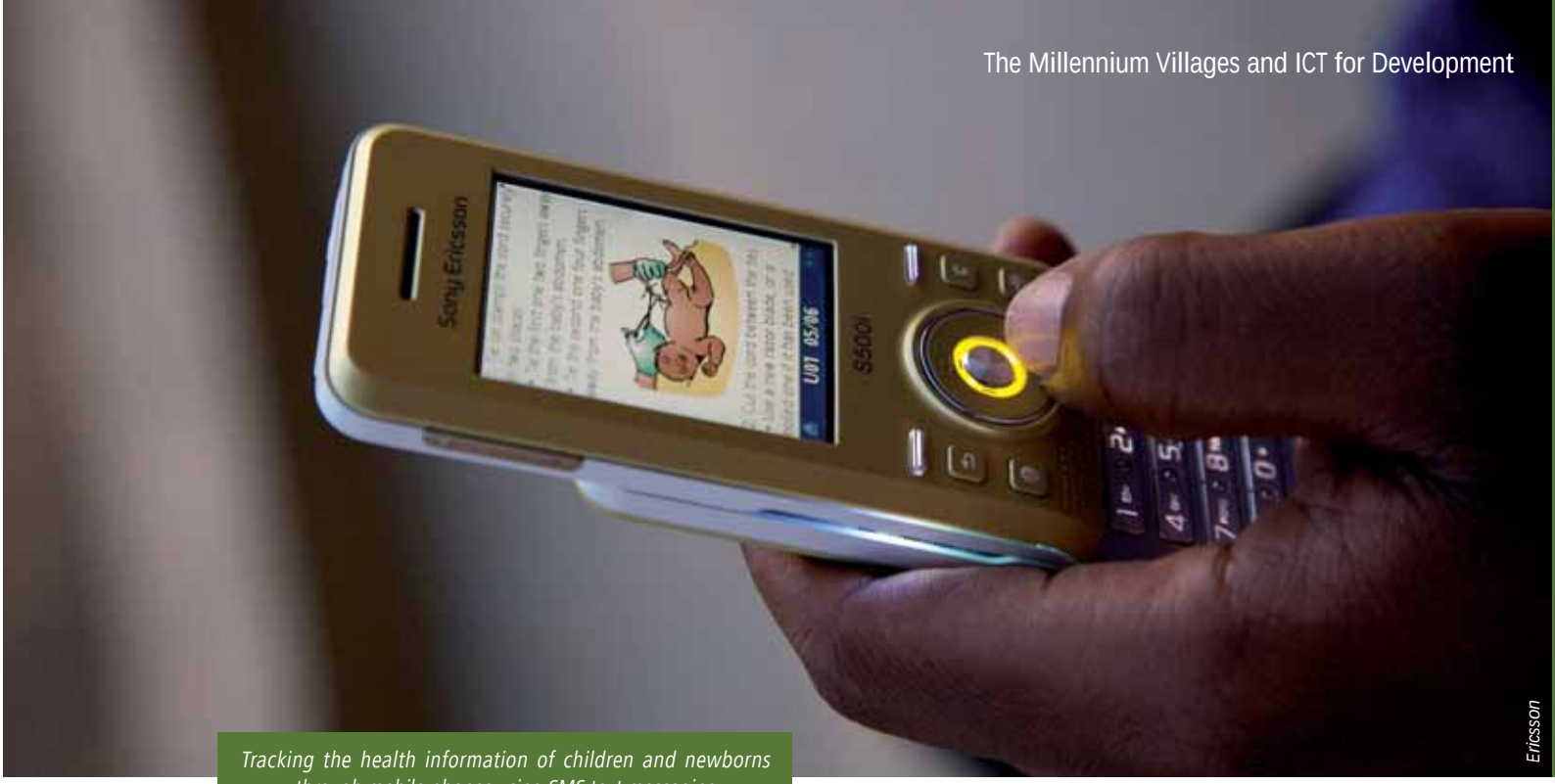
By Jeffrey D. Sachs

*The Millennium Villages Project (MVP) is a unique development programme that demonstrates the power of broadband for development. By deploying state-of-the art information and communication technology (ICT) applications in three key areas — health, education and infrastructure — the Millennium Villages help the world appreciate the power of broadband to support the achievement of the Millennium Development Goals (MDGs).*

## Millennium Village achievements

The Millennium Villages Project is an unprecedented partnership between academia, civil society, local governments, United Nations agencies and the private sector to achieve the MDGs. The approach is holistic: progress towards the MDGs in impoverished rural areas can be achieved through an integrated package of interventions in agriculture, education, health, roads, power, ICT, water and sanitation, and business development. During the first five years of its operation, the Millennium Villages Project has demonstrated that such an approach makes it possible to increase food security, reduce hunger, improve education, decrease maternal and childhood mortality, improve local infrastructure, and control malaria, AIDS and tuberculosis.

*Jeffrey D. Sachs is Director of the Earth Institute, Director of the Millennium Villages Project, and Special Advisor to United Nations Secretary-General Ban Ki-moon on the Millennium Development Goals. He is also a member of the Broadband Commission for Digital Development, and chairs the Commission's Task Force on ICT and Health.*




Ericsson

*Tracking the health information of children and newborns through mobile phones using SMS text messaging*

The Millennium Villages Project now operates in 14 clusters of villages in 10 countries in sub-Saharan Africa, reaching more than 500 000 people. The clusters are drawn from a diversity of agro-ecological and economic zones, and represent some of the most disadvantaged regions of Ethiopia, Kenya, Rwanda, Uganda, Tanzania, Malawi, Mali, Nigeria, Ghana and Senegal. The success of the Millennium Villages Project during the past five years is spurring a massive adoption of integrated rural development programmes in countries such as Nigeria.

The partnership with the host governments and United Nations agencies ensures strong national-level support and ties to global policy agendas, while links to industry and academia ensure that the interventions are cutting-edge models to be adopted more widely. The United Nations agency partnerships include those with: the Joint United Nations Programme on HIV/AIDS (UNAIDS) to end mother-to-child transmission of HIV and to scale up the deployment of trained community health workers; the United Nations Populations Fund (UNFPA) to promote family planning and maternal health; the United Nations Development Programme (UNDP) to promote MDG-based policies; the United Nations Office for Project Services (UNOPS) to provide operational support at the village level; and the World Food Programme to ensure food security and improved livelihoods for smallholder farmers. There are also dozens of corporate partners across many sectors: health, education, infrastructure, microfinance and ICT.

## ICT support to all sectors

ICT is a fundamental component of interventions across all sectors, including health, education, agriculture, infrastructure, energy, and business development. Wireless connectivity has been provided in each of the Millennium Village sites through partnerships with Ericsson, Bharti AirTel, MTN, Orange, and others. The Millennium Villages Project has demonstrated how ICT and broadband can be used to enhance development through projects ranging from mobile applications for decision-making support in the health sector, to the use of mobile phones for data collection and systems management, to classrooms enabled with innovative technologies.

Information technologies such as mobile phones, Internet connections in schools and community centres, and radio can enable training of health, education, agriculture and water personnel. They can allow better management of health delivery systems, and aid farmers by providing timely information on

markets, prices and weather. ICT can be used to improve access to credit and remittances, as well as information on creating and managing businesses. Radio instruction and Internet access can further education, while better access to communications can empower and increase the impact of stakeholders' voices. The Millennium Villages Project provides a powerful platform for developing and implementing new solutions that demonstrate the transformational power of broadband and ICT for development and the achievement of the MDGs.

The Millennium Villages Project particularly focuses on using ICT in three crucial areas: strengthening primary health systems though expanded mobile-health services; scaling up access to high-quality secondary education for girls through connectivity at schools; and providing access to renewable energy (electricity) and safe water using smart metering and broadband-enabled systems. The three come as a package, with large economies of scope and scale. The Millennium Villages are broadband-enriched communities, and view ICT not as a stand-alone intervention, but as a new way of life and community development.

## Community health workers

In the health sector, a crucial component of the Millennium Villages system is a cadre of professional community health workers. In the Millennium Village context, community health workers are salaried secondary school graduates generally from the local community. The community health workers are trained in a minimum set of core competencies and are empowered by mobile phones and ICT systems. There are now nearly 800 trained community health workers across the 14 Millennium Village sites, at a ratio of approximately one community health worker for every 100–200 households. By taking health care from the clinics directly to vulnerable households, the project has demonstrated improvements in disease prevention as well as in the early detection, treatment and referral of sick individuals.

Community health workers are an important link between the health sector and the community, and there is substantial evidence suggesting that they can be effective vehicles for reducing maternal and child mortality and improving health outcomes. They can also generate relevant information, for example through the registration of community health events including births and deaths, assessing the burden of illness such as that arising from acute malnutrition or malaria, and reporting on levels of coverage of essential interventions such as immunizations, antenatal care and skilled delivery.

## Data collecting and sharing via mobile phones

Nearly all Millennium Villages have high levels of mobile phone coverage through a partnership with Ericsson, and each Millennium Village community health worker is provided with a mobile phone. ChildCount+ (www.ChildCount.org) is a proven and scalable system that employs recent advances in mobile communications technology for collecting and using household-level information provided by community health workers. The aim of the ChildCount+ system is to reduce child and maternal deaths by facilitating early detection, referral, treatment and monitoring of common conditions including malaria and malnutrition. It enables community health workers to track the health information of children and newborns through mobile phones using SMS text messaging, and empowers community health workers to perform their tasks more efficiently and deliver high quality community-based health care.

The ChildCount+ system works with the Verbal Autopsy system. Verbal Autopsies are collected by specialists equipped

*The Millennium Villages Project and the Earth Institute are pioneering new systems bringing off-grid solar power to communities on a massive scale*

Ericsson

with android or similar smartphones, and are subjected to an algorithmic assessment of the medical cause of death as well as social circumstances surrounding the death. The medical cause-of-death algorithms are already established, based on valid techniques for determining the probable cause of death, and the algorithms have been adapted for local context. This innovation eliminates the need for dual physician-based assessments, which can be both expensive and create a long delay in generating real-time information for programme managers.

ChildCount+ with Verbal Autopsies provides information that informs decision-making on three levels: by facilitating text message "alerts" to community health workers to help target service delivery; providing reporting and visualization tools for information collected via community-based reporting; and generating information on the cause and social circumstances surrounding treatment delays and death to inform and improve the delivery of health and development interventions.

To date, the platform has registered 140 000 patients in the Millennium Villages, of whom 90 per cent were children aged less than 5 years. As an early indication of success in the Millennium Village of Sauri (Kenya), the percentage of infants less than 7 days old receiving an in-home checkup has risen from 31per cent at the start of the programme to more than 80 per cent. By using innovations in technology to empower, motivate and manage community health workers, ChildCount+ extends the reach of the health service and essential interventions directly to households that need them most.

## Solar power for remote communities

The Millennium Villages Project and the Earth Institute are also pioneering new systems in the Millennium Villages to bring off-grid solar power to the communities on a massive scale. To meet the goal of halving the proportion of people living in poverty, almost 1.2 billion additional people will need access to electricity by 2015. Currently, more than 560 million people in sub-Saharan Africa lack access, according to estimates prepared by the United Nations Development Programme. Developing countries are far behind in expanding access to modern energy, whether to meet nationally set energy access targets or to facilitate achievement of the Millennium Development Goals, for example by equipping schools and clinics with electricity. Given current energy access levels, it is clear that levels compatible with reaching the Millennium Development Goals will not be met

in almost all of the least developed countries and sub-Saharan African countries unless breakthroughs are made.

The solar power systems being pioneered by the Earth Institute are based on ICT, smart metering, pre-payments for electricity (as for mobile phones), and bottom-of-the-pyramid business models. Similar approaches can support business models for safe drinking-water in the communities as well, by linking pumps, smart meters, water payment systems, and small local businesses that support these systems.

Based upon a convergence of electrical metering, mobile phone technology, prepaid transactions and business systems, "shared metering" systems (whether for power, water or other services) provide a new and practical means for low-income households to buy electricity, piped water and other services, using a "pay as you go" model, where payments are made using a mobile phone, and the corresponding amount of electricity (or water) is credited to their account and meter.

SharedSolar, an innovative model developed at the Earth Institute, delivers solar electricity to remote areas where grid extension is difficult, via a prepaid payment model that is widely used for the purchase of mobile phone time. SharedSolar systems have been set up in Tiby (Mali), Mbola (Tanzania) and Ruhiira (Uganda), and show promising and informative early results. The core finding is that poor households in developing countries can become viable customers for a low load, individually metered power service — if that service is designed to fit their needs. Such customers can and will accept high power tariffs if they can pay in small, flexible instalments. As the system is expanded throughout sub-Saharan Africa, monitoring data will provide valuable insight into the economics of distributed energy generation in the Millennium Villages.

## Opening up educational opportunities

A final key ICT area is education. Today, despite progress made toward Millennium Development Goals 2 and 3, an estimated 67 million young people remain out of school, more than half of whom are girls. Even larger numbers now have no possibility to continue on to secondary education, even when they have succeeded in completing primary education and passing the national exams. The barriers to achieving universal secondary education include budget costs, a shortage of physical facilities, an insufficient number of trained teachers, and public policy neglect.

ICT and broadband can provide vital low-cost solutions to these barriers. ICT enables schools to connect to a world of information, and to connect children in one part of the world with children elsewhere for the purposes of building global goodwill and understanding. ICT and broadband can be used for massive training, upgrading of curricula, and building practical labour-market skills (including computer knowledge itself).

The world is poised to take on the challenges related to the quality of education and universal secondary schooling. The broadband sector can and should be in the lead. World political leaders are coming to appreciate that secondary education prepares young people — girls and boys alike — for economic and personal empowerment, and has a dramatic effect on economic growth and competitiveness, as well as public health, gender equality, disease control and maternal health. The Millennium Villages Project is demonstrating that ICT can make the goal of universal secondary education feasible.

Connect To Learn is a global education initiative of the Earth Institute, Ericsson, Airtel and the Millennium Village Project. Connect To Learn's approach is to increase access to schooling through scholarships, and to deploy broadband connectivity to help improve the quality of education through access to online learning resources. Connect To Learn has brought broadband

Ericsson

*Connect To Learn is a global education initiative of the Earth Institute, Ericsson, Airtel and the Millennium Village Project. Connect To Learn's approach is to increase access to schooling through scholarships, and to deploy broadband connectivity to help improve the quality of education through access to online learning resources*

connectivity to Millennium Village Project sites in Ghana and Tanzania, reaching more than 5000 students and 70 teachers in 5 secondary schools. The on-site implementation and training in the use of cloud computing offers a window on the world, and on all the information and resources it has to offer. Dozens of girls and boys from the Millennium Villages are now enrolled in secondary schools on Connect To Learn's full secondary school scholarships; basic ICT training has been conducted for teachers using computers, projectors and projection screens that change the nature and impact of teaching in these schools; and the School-To-School programme pairs a secondary school in a Millennium Village with a school in the United States or other developed country to enable shared learning and lesson plans, and cross-cultural exchange among teachers and students.

## Groundbreaking ICT to spur development

The world of ICT is changing at an unprecedented rate. At the start of the Millennium Villages Project in 2005, I could never have predicted the explosion of mobile telephony that would prove to have such a pervasive impact on all areas of daily life in Africa. Indeed, at the start of the project, the villages had neither landlines nor mobile phones; isolation was the dominant reality. The Millennium Villages Project is now harnessing these groundbreaking technologies to combat poverty, spur development, and ensure that even those in the remotest areas have access to health care, electricity and education. By deploying state-of-the art ICT applications in health, education and infrastructure, the Millennium Villages are demonstrating how ICT can and should play a central role in achieving the Millennium Development Goals.

## Handbook

### Spectrum Monitoring Edition of 2011

The Handbook on Spectrum Monitoring contains the latest information on all aspects of monitoring and represents a valuable reference manual for the spectrum management community. It is intended for use by administrations of both developing and developed countries and by the Radiocommunication Bureau. The Handbook will also be useful to radiocommunication engineers everywhere.

English, Arabic, Chinese, Spanish, French,Russian
Price: CHF 230.-

More information is available at: www.itu.int/pub/R-HDB-23-2011
E-mail: sales@itu.int
Tel.: +41 22 730 6141 (English) / +41 22 730 6142 (French)
+41 22 730 6143 (Spanish)

## Measuring the Information Society 2011

The 2011 edition of Measuring the Information Society features two benchmarking tools to measure the information society: the ICT Development Index (IDI) and the ICT Price Basket (IPB). The IDI captures the level of ICT developments in around 150 economies worldwide and compares progress made during the past two years. The IPB combines fixed telephone, mobile cellular and fixed broadband tariffs for around 160 economies into one measure and compares these across countries and over time. The report also presents the latest global market trends, takes a closer look at fixed and mobile broadband developments and analyses the digital divide among Internet users. The analytical report is complemented by a series of statistical tables providing country-level data for the indicators included in the two indices.

English only
Price: CHF 79.-

More information is available at: www.itu.int/pub/D-IND-ICTOI-2011
E-mail: sales@itu.int
Tel.: +41 22 730 6141 (English) / +41 22 730 6142 (French)
+41 22 730 6143 (Spanish)

AFP

# Top performers

## The Republic of Korea tops ICT ranking

*New ITU data, presented in the report Measuring the Information Society 2011, rank the Republic of Korea as the world's most advanced economy in terms of information and communication technologies (ICT), followed by Sweden, Iceland, Denmark and Finland. Each year, the report Measuring the Information Society features the latest ICT Development Index (IDI) and ICT Price Basket — two benchmarking tools to monitor information society developments worldwide. The new IDI ranks 152 economies and compares their scores for 2008 and 2010. This article highlights the performance of selected top economies.*

The ICT Development Index combines 11 indicators in a single measure that tracks ICT development over time. IDI measures ICT access, use and skills, and includes such indicators as mobile phone subscriptions, households with a computer, fixed and mobile broadband Internet subscriptions, and basic literacy rates. The scores of the 152 economies ranked in the IDI are presented on a scale from 1 to 10 (see table of rankings on page 42). These economies can be categorized into four groups: high (greater than 6.16); upper (between 4.09 and 6.04); medium (between 2.59 and 4.05); and low (lower than 2.55).

Most economies at the top of the ranking are from Europe and Asia-Pacific. Except for the Republic of Korea and Hong Kong (China), all economies in the top ten are from Europe. Looking at

*This article is adapted from Chapter 2: "The ICT Development Index" of the 2011 edition of the report* **Measuring the Information Society**, *prepared by the ICT Data and Statistics Division within the Telecommunication Development Bureau of ITU.*

the top thirty, apart from the United States and Canada, all are from Europe or East Asia and the Pacific. They largely correspond to the world's high-income economies, given the strong correlation between the level of ICT development and gross domestic product (GDP).

The United Arab Emirates and the Russian Federation rank first within their regions, and Uruguay ranks highest in Latin America. Some of the most dynamic countries were Saudi Arabia, Morocco, Viet Nam and the Russian Federation, all of which made substantial improvements in their IDI between 2008 and 2010. "While the IDI leaders are all from the developed world, it is extremely encouraging to see that the most dynamic performers are developing countries," said Dr Hamadoun I. Touré, Secretary-General of ITU.

The Republic of Korea has long been a leader in spreading ICT and increasing uptake, and has made ICT an engine of economic growth. By creating a competitive and dynamic regulatory environment, the Republic of Korea has become an inclusive information society. A number of government-driven initiatives — including the Giga internet pilot project, which includes the construction of 100 Mbit/s broadband networks in rural areas — will help to meet future demands. The Republic of Korea also tops the use sub-index. It has the highest mobile-broadband penetration worldwide (91 per cent), high fixed-broadband penetration (37 per cent) and excellent results in terms of households with Internet connections (97 per cent). The Republic of Korea is also outstanding in the skills sub-index, with high performance on all three indicators (secondary and tertiary school enrolment, and adult literacy).

Sweden ranks in second place for the second time. It displays high performance on all three sub-indices. With 90 per cent of the population using the Internet, Sweden is among the top five countries online, along with Iceland, Norway, the Netherlands and Luxembourg. Sweden is also among the world's top ten in commercial fibre-to-the-home (FTTH) penetration. This has been achieved through a successful public-private strategy involving private operators and local authorities. Mobile-broadband penetration is the third highest in the world (after the Republic of Korea and Japan). In Sweden there are now almost as many mobile-broadband subscriptions as fixed-broadband subscriptions. And mobile data traffic continues to grow strongly, with an increase of more than 90 per cent in 2010. This indicates that mobile-broadband uptake and use is matching that of fixed broadband.

Iceland moved up to third place in the IDI in 2010, from seventh place in 2008, and shows clear signs of crisis recovery. With 95 per cent of the population online, Iceland has the highest Internet-user penetration (92 per cent of households have Internet connections), as well as the highest fixed-line penetration and the highest proportion of households with computers (93 per cent). The higher IDI ranking results from the enthusiastic uptake of mobile broadband, which reached a penetration level of 45 per cent in 2010 (mobile broadband did not exist in Iceland in 2008). The country was among the last to assign 3G frequencies in Europe, the process having been delayed until 2007. Issuing 3G licences and refarming other bands to allow 3G services have enabled a new player, Nova, to enter the mobile market, previously dominated by the incumbent Siminn and Vodafone. By the end of 2010 Nova had secured the biggest market share of the mobile-broadband segment.

Finland moved from twelfth place in 2008 to fifth in 2010. This is the biggest jump among the top thirty economies in the IDI. Even though fixed-line network penetration decreased from 31 to 23 per cent, the country increased its international bandwidth by 150 per cent (from 200 000 Mbit/s to 500 000 Mbit/s), and its mobile-broadband uptake from 24 to 78 per cent.

As part of Finland's updated universal service obligation, the regulator FICORA requires the 26 operators to provide broadband connection to customers in their coverage areas, with at least a 1 Mbit/s connection as of July 2010, rising to 2 Mbit/s by 2012


and 100 Mbit/s by 2015. In 2010, new 4G technology (LTE) was launched in some of Finland's major cities (Turku and Espoo), gaining subscribers with early delivery in UHF bands.

Switzerland moved up one place to eighth in the 2010 IDI. The country has one of the highest fixed-broadband penetration rates worldwide (38 per cent), and a high proportion of households with computers and Internet access (86 per cent each). According to the Swiss Federal Communications Commission, the number of homes and businesses served by fibre had reached 250 000 by the end of 2010, representing approximately 8 per cent of households. Mobile broadband, on the other hand, is still emerging and, with 44 per cent penetration, Switzerland (ranked 25th globally) lags behind many of the top performers.

New Zealand moved up four places to twelfth in the 2010 IDI. International bandwidth per Internet user increased from 9 700 Mbit/s per user in 2008 to 19 300 Mbit/s per user in 2010, and other key indicators — such as mobile broadband, Internet access at home, Internet usage, and ICT skills — increased too. New Zealand's government has made broadband "a vital component of New Zealand's economic growth, productivity improvements and the government's wider strategy to increase New Zealand's global competitiveness". To upgrade the country's broadband infrastructure, the government has earmarked a total of NZD 1.5 billion, of which 300 million is allocated to improving rural broadband connectivity.

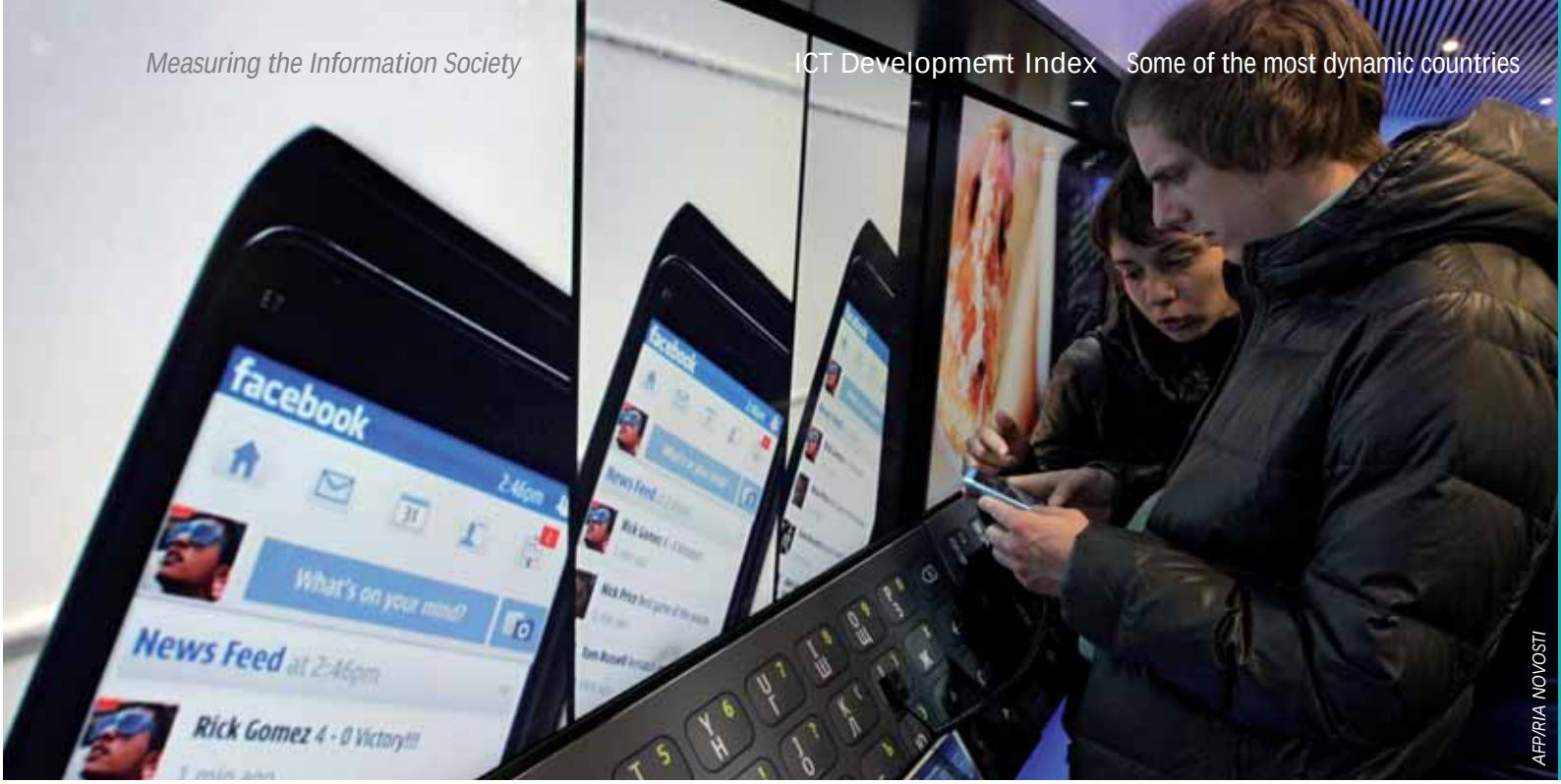
Austria moved up from 21st place in 2008 to 16th place in 2010, mainly because of the increase in the number of mobile-telephone and mobile-broadband subscriptions, and the increase in international bandwidth. According to customer surveys, 76 per cent of residential mobile-broadband customers use mobile broadband on a standalone basis, usually from a fixed location. This has led the regulator to conclude that mobile broadband is a substitute for — rather than a complement to — fixed broadband. So far, Austria is the only European Union country where fixed-mobile broadband substitution is apparent.

The United States held 17th place in both 2008 and 2010. The mobile phone penetration rate of 85 per cent is low compared with a rate of more than 100 per cent for most European countries. The household Internet access rate of 71 per cent is lower than European rates (which range from 85 to 90 per cent). In the access sub-index, the United States dropped from 20th to 23rd. Mobile broadband is, however, increasing rapidly in the country, with penetration rates rising to 54 per cent at the end of 2010, compared with 26 per cent at the end of 2008.

## ICT Development Index (IDI), 2010 and 2008

| Economy | Rank 2010 | IDI 2010 | Rank 2008 | IDI 2008 |
|---|---|---|---|---|
| Korea (Republic of) | 1 | 8.40 | 1 | 7.80 |
| Sweden | 2 | 8.23 | 2 | 7.53 |
| Iceland | 3 | 8.06 | 7 | 7.12 |
| Denmark | 4 | 7.97 | 3 | 7.46 |
| Finland | 5 | 7.87 | 12 | 6.92 |
| Hong Kong, China | 6 | 7.79 | 6 | 7.14 |
| Luxembourg | 7 | 7.78 | 4 | 7.34 |
| Switzerland | 8 | 7.67 | 9 | 7.06 |
| Netherlands | 9 | 7.61 | 5 | 7.30 |
| United Kingdom | 10 | 7.60 | 10 | 7.03 |
| Norway | 11 | 7.60 | 8 | 7.12 |
| New Zealand | 12 | 7.43 | 16 | 6.65 |
| Japan | 13 | 7.42 | 11 | 7.01 |
| Australia | 14 | 7.36 | 14 | 6.78 |
| Germany | 15 | 7.27 | 13 | 6.87 |
| Austria | 16 | 7.17 | 21 | 6.41 |
| United States | 17 | 7.09 | 17 | 6.55 |
| France | 18 | 7.09 | 18 | 6.48 |
| Singapore | 19 | 7.08 | 15 | 6.71 |
| Israel | 20 | 6.87 | 23 | 6.20 |
| Macao, China | 21 | 6.84 | 27 | 5.84 |
| Belgium | 22 | 6.83 | 22 | 6.31 |
| Ireland | 23 | 6.78 | 19 | 6.43 |
| Slovenia | 24 | 6.75 | 24 | 6.19 |
| Spain | 25 | 6.73 | 25 | 6.18 |
| Canada | 26 | 6.69 | 20 | 6.42 |
| Portugal | 27 | 6.64 | 29 | 5.70 |
| Italy | 28 | 6.57 | 26 | 6.10 |
| Malta | 29 | 6.43 | 31 | 5.68 |
| Greece | 30 | 6.28 | 30 | 5.70 |
| Croatia | 31 | 6.21 | 36 | 5.43 |
| United Arab Emirates | 32 | 6.19 | 32 | 5.63 |
| Estonia | 33 | 6.16 | 28 | 5.81 |
| Hungary | 34 | 6.04 | 34 | 5.47 |
| Lithuania | 35 | 6.04 | 35 | 5.44 |
| Cyprus | 36 | 5.98 | 43 | 5.02 |
| Czech Republic | 37 | 5.97 | 37 | 5.42 |
| Poland | 38 | 5.95 | 41 | 5.29 |
| Slovak Republic | 39 | 5.94 | 40 | 5.30 |
| Latvia | 40 | 5.90 | 39 | 5.31 |
| Barbados | 41 | 5.83 | 33 | 5.47 |
| Antigua and Barbuda | 42 | 5.63 | 38 | 5.32 |
| Brunei Darussalam | 43 | 5.61 | 44 | 4.97 |
| Qatar | 44 | 5.60 | 48 | 4.50 |
| Bahrain | 45 | 5.57 | 42 | 5.16 |
| Saudi Arabia | 46 | 5.42 | 55 | 4.13 |
| Russian Federation | 47 | 5.38 | 49 | 4.42 |
| Romania | 48 | 5.20 | 46 | 4.67 |
| Bulgaria | 49 | 5.19 | 45 | 4.75 |
| Serbia | 50 | 5.11 | 47 | 4.51 |
| Montenegro | 51 | 5.03 | 50 | 4.29 |
| Belarus | 52 | 5.01 | 58 | 3.93 |
| The Former Yugoslav Republic of Macedonia | 53 | 4.98 | 52 | 4.20 |
| Uruguay | 54 | 4.93 | 51 | 4.21 |
| Chile | 55 | 4.65 | 54 | 4.14 |
| Argentina | 56 | 4.64 | 53 | 4.16 |
| Moldova | 57 | 4.47 | 64 | 3.57 |
| Malaysia | 58 | 4.45 | 57 | 3.96 |
| Turkey | 59 | 4.42 | 60 | 3.81 |
| Oman | 60 | 4.38 | 68 | 3.45 |
| Trinidad and Tobago | 61 | 4.36 | 56 | 3.99 |
| Ukraine | 62 | 4.34 | 59 | 3.83 |
| Bosnia and Herzegovina | 63 | 4.31 | 63 | 3.58 |
| Brazil | 64 | 4.22 | 62 | 3.72 |
| Venezuela | 65 | 4.11 | 61 | 3.73 |
| Panama | 66 | 4.09 | 67 | 3.52 |
| Maldives | 67 | 4.05 | 66 | 3.54 |
| Kazakhstan | 68 | 4.02 | 72 | 3.39 |
| Mauritius | 69 | 4.00 | 70 | 3.43 |
| Costa Rica | 70 | 3.99 | 69 | 3.45 |
| Seychelles | 71 | 3.94 | 65 | 3.56 |
| Armenia | 72 | 3.87 | 86 | 2.94 |
| Jordan | 73 | 3.83 | 73 | 3.29 |
| Azerbaijan | 74 | 3.78 | 83 | 2.97 |
| Mexico | 75 | 3.75 | 74 | 3.26 |
| Colombia | 76 | 3.75 | 71 | 3.39 |
| Georgia | 77 | 3.65 | 85 | 2.96 |
| Albania | 78 | 3.61 | 81 | 2.99 |
| Lebanon | 79 | 3.57 | 77 | 3.12 |
| China | 80 | 3.55 | 75 | 3.17 |
| Viet Nam | 81 | 3.53 | 91 | 2.76 |
| Suriname | 82 | 3.52 | 78 | 3.09 |
| Peru | 83 | 3.52 | 76 | 3.12 |
| Tunisia | 84 | 3.43 | 82 | 2.98 |
| Jamaica | 85 | 3.41 | 79 | 3.06 |
| Mongolia | 86 | 3.41 | 87 | 2.90 |
| Iran (Islamic Republic of) | 87 | 3.39 | 84 | 2.96 |
| Ecuador | 88 | 3.37 | 88 | 2.87 |
| Thailand | 89 | 3.30 | 80 | 3.03 |
| Morocco | 90 | 3.29 | 100 | 2.60 |
| Egypt | 91 | 3.28 | 92 | 2.73 |
| Philippines | 92 | 3.22 | 95 | 2.69 |
| Dominican Rep. | 93 | 3.21 | 89 | 2.84 |
| Fiji | 94 | 3.16 | 90 | 2.82 |
| Guyana | 95 | 3.08 | 93 | 2.73 |
| Syrian Arab Republic | 96 | 3.05 | 96 | 2.66 |
| South Africa | 97 | 3.00 | 94 | 2.71 |
| El Salvador | 98 | 2.89 | 101 | 2.57 |
| Paraguay | 99 | 2.87 | 97 | 2.66 |
| Kyrgyzstan | 100 | 2.84 | 99 | 2.62 |
| Indonesia | 101 | 2.83 | 107 | 2.39 |
| Bolivia (Plurinational State of) | 102 | 2.83 | 102 | 2.54 |
| Algeria | 103 | 2.82 | 105 | 2.41 |
| Cape Verde | 104 | 2.81 | 103 | 2.50 |
| Sri Lanka | 105 | 2.79 | 106 | 2.41 |
| Honduras | 106 | 2.72 | 104 | 2.42 |
| Cuba | 107 | 2.69 | 98 | 2.62 |
| Guatemala | 108 | 2.65 | 108 | 2.39 |
| Botswana | 109 | 2.59 | 109 | 2.25 |
| Uzbekistan | 110 | 2.55 | 110 | 2.22 |
| Turkmenistan | 111 | 2.50 | 111 | 2.15 |
| Gabon | 112 | 2.42 | 112 | 2.10 |
| Namibia | 113 | 2.36 | 114 | 2.06 |
| Nicaragua | 114 | 2.31 | 113 | 2.09 |
| Kenya | 115 | 2.29 | 116 | 1.74 |
| India | 116 | 2.01 | 117 | 1.72 |
| Cambodia | 117 | 1.99 | 120 | 1.63 |
| Swaziland | 118 | 1.93 | 115 | 1.80 |
| Bhutan | 119 | 1.93 | 123 | 1.58 |
| Ghana | 120 | 1.90 | 118 | 1.68 |
| Lao P.D.R. | 121 | 1.90 | 119 | 1.64 |
| Nigeria | 122 | 1.85 | 125 | 1.54 |
| Pakistan | 123 | 1.83 | 121 | 1.59 |
| Zimbabwe | 124 | 1.81 | 128 | 1.49 |
| Senegal | 125 | 1.78 | 129 | 1.46 |
| Gambia | 126 | 1.74 | 122 | 1.59 |
| Yemen | 127 | 1.72 | 127 | 1.49 |
| Comoros | 128 | 1.67 | 130 | 1.44 |
| Djibouti | 129 | 1.66 | 124 | 1.56 |
| Côte d'Ivoire | 130 | 1.61 | 132 | 1.43 |
| Mauritania | 131 | 1.58 | 126 | 1.50 |
| Angola | 132 | 1.58 | 136 | 1.31 |
| Togo | 133 | 1.57 | 134 | 1.36 |
| Nepal (Republic of) | 134 | 1.56 | 137 | 1.28 |
| Benin | 135 | 1.54 | 138 | 1.27 |
| Cameroon | 136 | 1.53 | 133 | 1.40 |
| Bangladesh | 137 | 1.52 | 135 | 1.31 |
| Tanzania | 138 | 1.51 | 141 | 1.23 |
| Zambia | 139 | 1.50 | 131 | 1.44 |
| Uganda | 140 | 1.49 | 140 | 1.24 |
| Madagascar | 141 | 1.45 | 142 | 1.20 |
| Rwanda | 142 | 1.44 | 143 | 1.18 |
| Papua New Guinea | 143 | 1.38 | 139 | 1.24 |
| Guinea | 144 | 1.31 | 144 | 1.16 |
| Mozambique | 145 | 1.30 | 146 | 1.10 |
| Mali | 146 | 1.26 | 145 | 1.11 |
| Democratic Republic of the Congo | 147 | 1.17 | 147 | 1.04 |
| Eritrea | 148 | 1.09 | 148 | 1.03 |
| Burkina Faso | 149 | 1.08 | 149 | 0.98 |
| Ethiopia | 150 | 1.08 | 150 | 0.94 |
| Niger | 151 | 0.92 | 152 | 0.79 |
| Chad | 152 | 0.83 | 151 | 0.80 |

*Source: ITU, Measuring the Information Society 2011, Chapter 2 "The ICT Development Index".*




AFP/RIA NOVOSTI

# Some of the most dynamic countries

## What has propelled them up the ranking?

*A number of developing countries have made outstanding progress in increasing ICT access and use. This article highlights some of the factors that have propelled the dynamic countries up the ranking.*

### Better scores, higher ranking

Azerbaijan jumped nine places to 74th and increased its ICT Development Index (IDI) score by 27 per cent. With almost no mobile broadband, the country's ICT progress is fuelled by fixed-broadband penetration, which increased from near zero to 5 per cent, most likely as a result of the 90 per cent drop in prices.

Belarus improved its IDI score by 28 per cent, primarily as a result of high growth in the number of Internet users, and in fixed- and mobile-broadband subscriptions.

Georgia moved up eight places to 77th, making significant advances in the indicators for access and use. Mobile-broadband penetration climbed to 18.8 per cent (up from 9 per cent), the highest among the Commonwealth of Independent States (CIS).

Moldova moved up seven places to 57th and increased its score by 25 per cent. International bandwidth doubled, and household access to Internet grew from 16 to 34 per cent. There were also big increases in fixed- and mobile-broadband penetration and Internet use.

*This article is adapted from Chapter 2 "The ICT Development Index" of the 2011 edition of the report* **Measuring the Information Society,** *prepared by the ICT Data and Statistics Division within the Telecommunication Development Bureau of ITU.*

Qatar moved up four places to 44th, thanks to Internet use growing from 38 to 69 per cent, and a substantial increase in household access to computers and the Internet.

## Broadband band-wagon

Operators worldwide have sought extra capacity to cater for an increasing number of Internet users. International bandwidth has grown rapidly in all regions of the world, bringing down both wholesale and retail broadband prices. A number of new fibre-optic submarine cables, in particular in Africa, have substantially increased bandwidth capacity. Comoros, for example, was connected to a submarine cable for the first time in 2010, increasing bandwidth tenfold within a period of a few months. Madagascar has increased international bandwidth from 155 Mbit/s to close to 2 Gbit/s.

## Armenia's surge in Internet use

The country that improved most is Armenia, which moved up 14 places to 72nd, while increasing its IDI score by 31 per cent. Mobile penetration increased from 75 to 125 per cent, and household access to computers and the Internet also rose significantly. These factors plus the recently available fixed- and mobile-broadband services led to growth in use.

An increase in international bandwidth from 1 083 Mbit/s to 10 547 Mbit/s and growth in mobile-phone subscriptions have contributed to greater access. Mobile broadband subscriptions increased from nothing to 5 per cent.

Fixed-broadband penetration is around 3 per cent but there are signs of growth. The Ministry of Economy of Armenia plans to expand the country's high-speed broadband network through a mixture of fibre-optic, WiMAX and satellite technologies. The country's main operator ArmenTel has extended its 3G footprint, deploying additional 3G base stations in new regions so as to improve coverage.

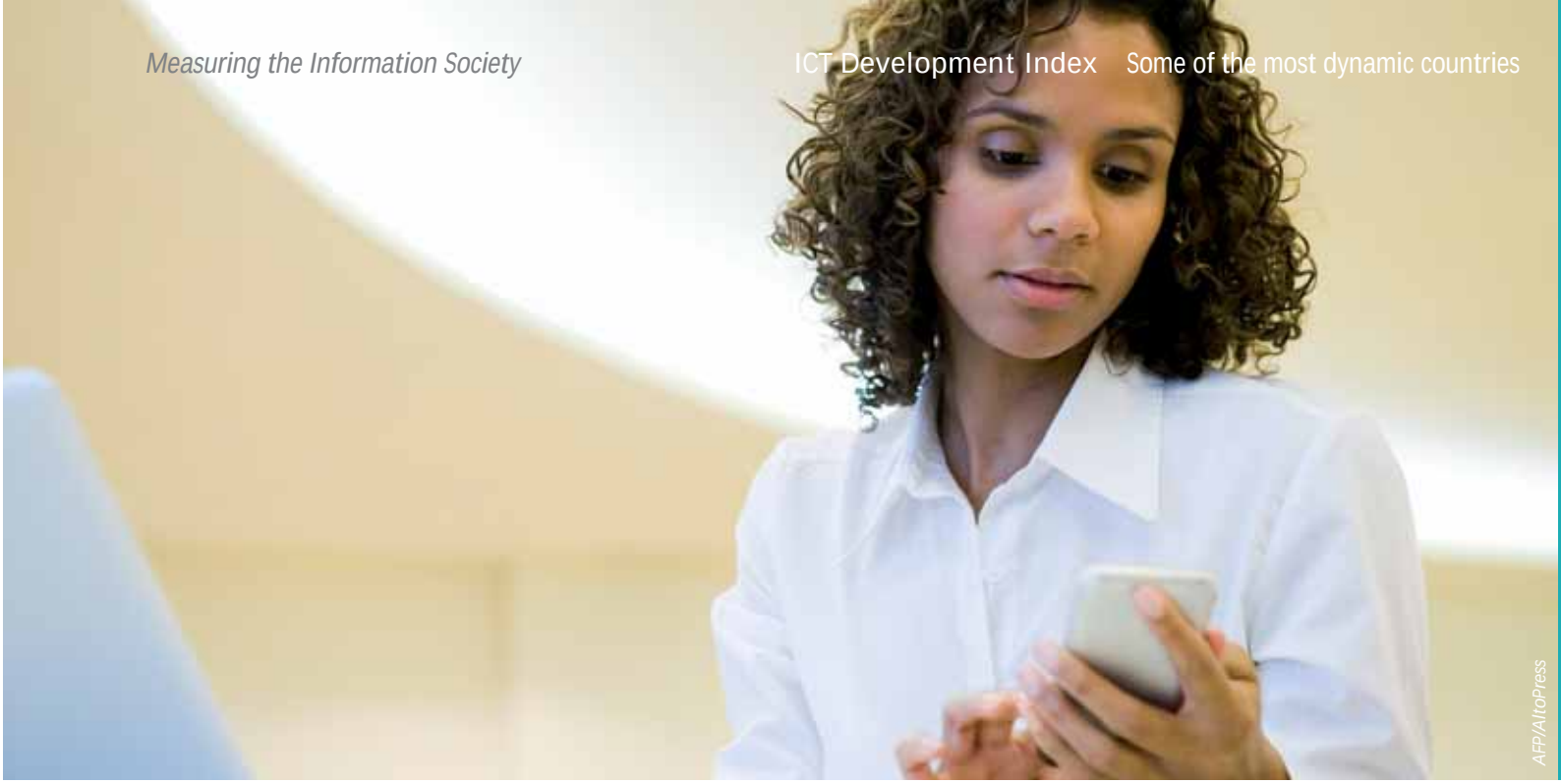
## Kenya — Africa's fastest growing Internet market

Kenya has significantly increased its international bandwidth, mobile-phone and mobile-broadband penetration, and number of Internet users. This dynamic progress is reflected in a 29 per cent increase in its IDI score. Kenya is one of the top ten countries in reducing ICT prices, and this helps to explain the increase in mobile subscriptions and Internet use. Kenya now has 10.2 million Internet users and a penetration rate of 26 per cent.

Mobile-phone tariffs have dropped considerably as a result of increasing competition between providers. New entrant Airtel sparked a price war in the Kenyan market in 2010 by reducing voice-call rates by half and cutting SMS charges from KES 3 to KES 1 (USD 0.03 to USD 0.01). Competitor operators, such as Safaricom and Telkom Kenya, followed suit, making further cuts to their mobile rates. The cheaper calling rates captured new subscribers in under-penetrated market segments and made mobile-phone services more affordable.

Airtel continues to shake up the market as it rolls out its 3G network and doubles the number of 2G stations already deployed. The Communications Commission of Kenya (CCK) has confirmed authorization of mobile-number portability. This will provide users with the flexibility to change between service providers.

In alliance with Gateway Business Africa, Verizon Business (a unit of US Verizon Communications) has expanded its IP network coverage in Kenya to serve Verizon's business customers. The aim is to provide better connectivity in eastern Africa and other developing regions. Another network extension in Kenya is the Lower Indian Ocean Network (LION) project. In consortium with Africa Coast to Europe (ACE), this project involves the construction of undersea cables in the Indian Ocean providing broadband




Internet service between Europe and South Africa. The entire network project is expected to be completed by 2012. The second phase of the project has started and will increase bandwidth capacity up to 1.28 Tbit/s.

## Mobile Internet in Morocco

Morocco has moved up ten places to 90th. Internet access at home increased significantly, as did broadband penetration, contributing to an overall growth in the number of Internet users. Fixed-broadband prices have fallen by 40 per cent.

International bandwidth increased from 25 130 Mbit/s to 75 000 Mbit/s and Internet user penetration increased by almost 50 per cent, mainly because of mobile broadband. The availability of 3G mobile-broadband services pushed mobile-broadband penetration up from 2.3 per cent to 10 per cent. In contrast, fixed-broadband penetration recorded just 1 per cent growth. Mobile-broadband accounts for 76 per cent of total broadband subscriptions in Morocco.

Three operators compete in the mobile-broadband Internet market, causing mobile-broadband prices to fall. Today, mobile-broadband prices are competitive with fixed-broadband prices. The fixed-broadband ADSL market is dominated by incumbent operator Maroc Telecom, which holds a monopoly.

Maroc Telecom continues to develop the fibre-optic backbone network, which will link Morocco with West African countries. By 2010, the first phase was 60 per cent complete. Maroc Telecom also plans to offer m-commerce facilities, in view of the growing demand for mobile financial transactions.

Moroccan telecommunication regulator ANRT has set a target for Morocco's mobile operators to reduce voice-termination interconnection tariffs on fixed and mobile calls by 65–70 per cent between 2010 and 2013. ANRT has also set a target to reduce asymmetric interconnection tariffs by 24–40 per cent by 2013. These measures are being taken in the interests of end users.

## Oman connects schools to the Internet

Oman moved up eight places to 60th, increasing its score by 27 per cent. There was improvement in almost all of the indicators, but the most significant factor was the increase in Internet user penetration. This mainly resulted from the availability of mobile broadband coupled with an increase in public Internet access.

The number of Internet users per 100 inhabitants has increased from 20 to 63. Popular use of Internet cafés, and the younger generation participating in social media activities and blogging, contributed to driving the growth in Internet use. Fixed-broadband Internet subscriptions are still low, at 2 per cent, but growth is evident in mobile broadband, with a penetration rate of 11 per cent (up from 6 per cent).

Oman has decided to invest in ICT for education, and the Ministry of Education has implemented various policies to connect the country's schools to improve ICT skills and to integrate ICT in the curriculum. The telecommunication regulatory authority ITA plans to connect all schools to the Internet and to provide all students and teachers with laptops. These initiatives are part of the government's eOman project, which aims at creating a knowledge-based economy and society.

Oman's mobile sector is now highly competitive, with five resellers entering the market in 2010. Omantel is the main operator, along with new provider Nawras. The introduction of resellers is the result of the government's efforts to create a more competitive telecommunication sector for the saturated market (166 per cent mobile-penetration rate). The mobile-phone sector increased 43 per cent to reach 4.6 million subscriptions. New entrants generally base their business model on low rates and discount plans.

Unlike the competitive mobile market, Oman's shrinking fixed-line sector is a duopoly of Omantel and Nawras. Recently, Nawras acquired licences for fixed lines and international gateway. By launching commercial fixed-line services, Nawras may reverse the decline.

Omantel is part of the Europe to India (EIG) submarine cable consortium, and early in 2011 announced partial activation of the undersea cable. This will enhance capacity between the Middle East and Asia and Europe with a full cable system up to 3.84 Tbit/s.

## Saudi Arabia takes to the mobile-phone

Saudi Arabia jumped nine places to 46th, having improved its score by 31 per cent. The country now has the third highest mobile-cellular penetration worldwide (186 per cent), after Macao (China) and Hong Kong (China).

International bandwidth grew from 20 000 Mbit/s to 317 940 Mbit/s, and mobile-phone subscriptions rose from 138 to 188 per 100 inhabitants. Internet user penetration stands at 41 users per 100 inhabitants, fixed-broadband subscriptions showed a 36 per cent increase, and mobile-broadband penetration grew from 9 per cent to 58 per cent.

The large increase in mobile-broadband subscriptions is the main driver of increasing ICT use. Expatriate customers and young people are an influential part of this subscription base, and there is still plenty of growth potential in the broadband market.

The Saudi Arabian mobile sector is a competitive market, with presence of the three largest Middle Eastern regional players (STC, Etisalat and Zain). Mobily is pushing to extend the mobile-broadband network, after winning the GSM/3G licence in 2004, and has plans to provide WiMAX service to the 20 cities it covers. Fixed-telephone line penetration remains steady, with 4 165 750 lines and a penetration rate of 15 per cent.

Under the National Communications and Information Technology Plan, the government has launched projects, especially in the e-business segment, to facilitate Internet access and improve performance.

## Uruguay expands ICT access and use

Uruguay is the top Latin American country in the IDI ranking (ranked 54th). The fixed-telephone line penetration rate of 29 per cent contrasts with the country's mobile-penetration rate, which has climbed to a staggering 131 per cent (up from 105 per cent). The mobile market has made great strides, led by Ancel, the mobile arm of State-owned incumbent Administración Nacional de

Telecomunicaciones (Antel). As the market grows, newcomers are beginning to come in, putting pressure on tariffs and competing for new areas.

There has been a large increase in international bandwidth. In a consortium with submarine service provider IT Telecom and Alcatel-Lucent, Antel began deployment of the 250 km submarine cable network in 2010. This undersea project is part of efforts to provide greater capacity to countries served by Antel and Telcom Argentina. Internet use has increased, and more than four out of ten people are users.

Under its fibre-to-the-home (FTTH) roll-out plans, Antel aims to connect around 80 000 households by the end of 2011 and reach 200 000 households by the end of 2012. It has also upgraded its HSDPA+ technology and is planning for the next future LTE technology.

## Viet Nam gets 3G

Viet Nam (ranked 81st) increased its IDI score by 28 per cent, rising ten places. Mobile-phone penetration climbed from 87 to 175 per cent. This puts the country in eighth place worldwide in terms of mobile-phone penetration. In contrast, household access to computers and the Internet is still low. Mobile broadband has grown from practically nothing to 13 per cent.

Viet Nam performed well in access, with significant gains in mobile penetration and international bandwidth per user. The official launch of 3G services at the end of 2009 has contributed to more than doubling mobile subscriptions.

According to telecommunication operator Vinaphone, the high-speed 3G availability of services such as mobile Internet games, multimedia, mobile television and online newspapers, together with new iPhone and HTC products, have all contributed to the country's mobile-broadband success. International bandwidth rose from 50 064 Mbit/s to 134 420 Mbit/s. Viet Nam is now connected with three international gateways. The third Asia-America Gateway (AAG) opened in November 2009, connecting southern Asia to America by way of an undersea cable system with an international transmission capacity of 500 Gbit/s.

Shutterstock

Getty Images/Michael Blann

# Broadband prices are falling

## But huge disparities in speeds and cost remain between countries

Figures published by ITU in its report *Measuring the Information Society 2011* show that the uptake of information and communication technologies (ICT) continues to accelerate worldwide, spurred by a steady fall in the price of telephone and broadband Internet services. Commenting on the new report, Dr Hamadoun I. Touré, Secretary-General of ITU, said "The 'mobile miracle' is putting ICT services within reach of even the most disadvantaged people and communities. Our challenge now is to replicate that success in broadband."

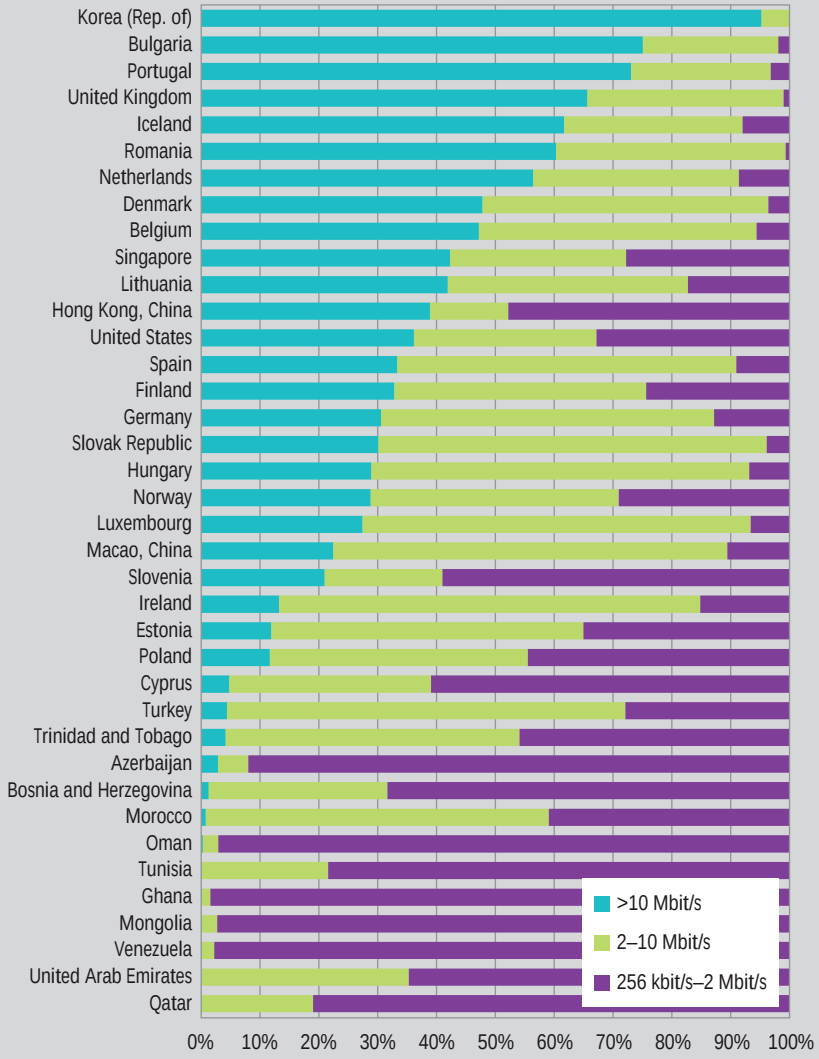
*This article is adapted from Chapter 3 "The ICT Price Basket (IPB)" and Chapter 4: "Understanding broadband: addressing issues of capacity, speed and quality of service" of the 2011 edition of the report* **Measuring the Information Society**, *prepared by the ICT Data and Statistics Division within the Telecommunication Development Bureau of ITU.*

### Mobile now ubiquitous

The spread of mobile networks in developing countries remains buoyant, with 20 per cent growth in mobile subscriptions over the past year and no signs of a slowdown. In developed countries, mobile phone penetration has reached saturation — average penetration was more than 100 per cent at the end of 2010, compared with 70 per cent in developing countries. With more than five billion subscriptions and global population coverage exceeding 90 per cent, mobile cellular is now de facto ubiquitous.

Mobile broadband (3G) services are also spreading quickly. By the end of 2010, a total of 154 economies worldwide had launched 3G networks. Wireless broadband Internet access remains the strongest growth sector in developing countries, with mobile broadband growing by 160 per cent between 2009 and 2010.

*Fixed (wired) broadband subscriptions by speed, selected economies, 2010*




*Note — Data from Iceland refer to ADSL connections only, which account for 87 per cent of the market. Norway's speed intervals refer to: 128 kbit/s to ≤ 2 Mbit/s; 2 Mbit/s to ≤ 8 Mbit/s; and > 8 Mbit/s. Data from the Netherlands represent 95 per cent of the total broadband subscriptions in the country, and do not include fibre subscriptions, nor data from the smallest operators.*

*Source: ITU World Telecommunication/ICT Indicators database.*

Conversely, the number of dial-up Internet subscriptions has been decreasing rapidly since 2007. Based on current trends, dial-up will no longer exist in a few years time.

## Affordability improves, but the developing world still pays too much

Globally, telecommunication and Internet services are becoming more affordable. According to the 2010 ICT Price Basket, which spans 165 economies and combines the average cost of fixed telephone, mobile phone and fixed broadband Internet services, the price of ICT services dropped by 18 per cent globally between 2008 and 2010, with the biggest decrease in fixed broadband Internet services, where average prices have come down by 52 per cent.

The ten top-ranked economies in the ICT Price Basket have high gross national income per capita. With the exception of the United Arab Emirates, all are from Europe and Asia-Pacific. In developed countries, average prices for ICT services correspond to no more than 1.5 per cent of monthly per capita income, compared with 17 per cent in developing countries. Even though broadband prices have declined sharply worldwide, a high-speed Internet connection remains unaffordable in many low-income countries. For

example, in Africa at the end of 2010, fixed broadband services cost on average the equivalent of 290 per cent of monthly income, down from 650 per cent in 2008.

## Big disparities in speed and service quality

Comparing fixed and mobile broadband technologies and services in different countries, the report finds huge differences in network capacity, speed and quality. Data on fixed-broadband subscriptions broken down by (advertised) speed show that in countries such as Portugal, the United Kingdom and Bulgaria there are very few subscriptions with speeds below 2 Mbit/s — and none in the Republic of Korea — while in Azerbaijan, Oman, Ghana, Mongolia and Venezuela these speeds represent more than 90 per cent of total fixed-broadband connections (see chart).

In many developing countries, while the minimum speed for broadband (256 kbit/s) may be sufficient for e-mail and other very basic services it is inadequate for graphics-rich data-intensive applications and services. The report also notes that the actual speed experienced by customers both for fixed and mobile broadband is often much lower than the advertised speed. The report therefore calls on ICT regulators to take steps to encourage operators to provide consumers with clearer information on coverage, speed and prices.

"A new digital divide is unfolding between those with high-speed/capacity/quality access — as is the case in many high-income countries — and those with lower speed/capacity/quality access, as is the case in many low-income countries," says Brahima Sanou, Director of ITU's Telecommunication Development Bureau. "Policy-makers should act swiftly to facilitate the spread of broadband and ensure that broadband services are faster, more reliable and affordable."

The report highlights qualitative differences between fixed and mobile broadband services. The average speed of a mobile broadband subscription does not usually match that of a high-speed fixed subscription, and it usually includes data caps, unlike the fixed broadband offers of unlimited data that are now widely available. This represents a challenge for countries, where mobile is the only broadband access technology available to end users — which is the case in many developing countries.

## Targeting youth could be transformational

ITU research indicates that targeting students may be the most effective way to increase Internet use in developing countries. The Internet is used by around 21 per cent of the population in the developing world, compared with almost 70 per cent in developed countries.

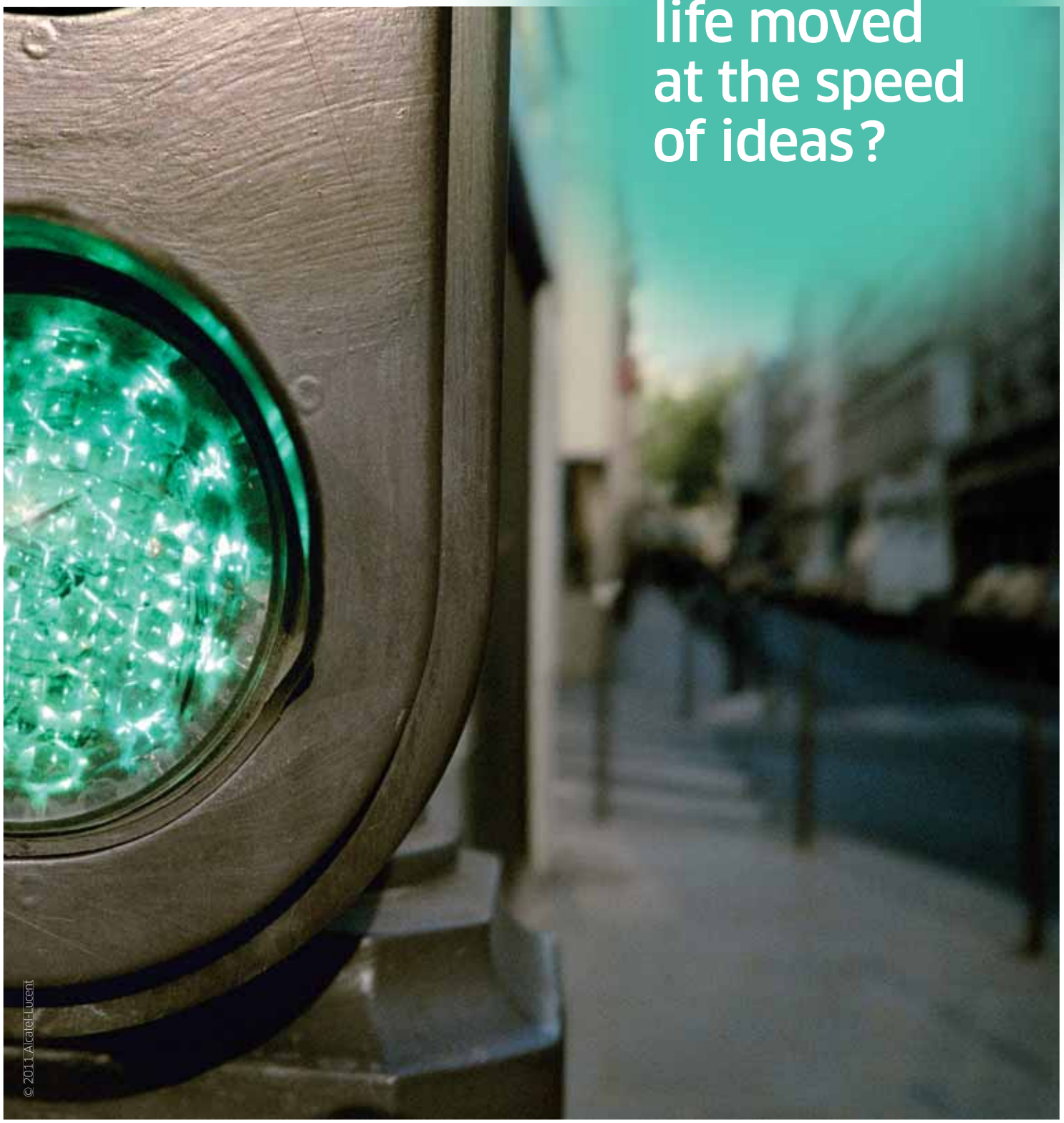
The report suggests that the main barriers to Internet use are not always related to infrastructure and price. Usage patterns show major differences related to education, gender, income, age and geographical location of users (urban or rural). For example, there is remarkably little difference in patterns of Internet use among highly educated, high-income individuals across the developing and developed worlds. People with higher educational degrees use the Internet more than those with a lower level of education, and in most countries more men than women are online.

Young people (younger than 25 years of age) are online more than older people, and there is a higher level of Internet use among those in school compared with those no longer studying. Assuming that people will continue using the Internet once they have become accustomed to being online, those now enrolled at school or university are likely to be future Internet users. For young people all over the world, social networking and user-created content such as blogs have become key drivers of Internet uptake.

Given that 46 per cent of the population in developing countries is younger than 25 years of age (representing more than 2.5 billion people), *Measuring the Information Society 2011* suggests that one of the most effective ways to increase Internet use in these countries is by targeting the younger generation — for example through connecting schools and other educational institutions, and improving enrolment rates.

Great ideas grow and develop, are exchanged and changed. Our ideas have made possible the networks that exist today, so your ideas can live and thrive on the network.

# What if life moved at the speed of ideas?





Alcatel·Lucent

AT THE SPEED OF IDEAS™

# Connect a School, Connect a Community

## Nicaragua's National School Connectivity Plan

### Offering far-away schoolchildren access to the digital world

*In less than six months, an ITU pioneering project in Nicaragua has provided children at five remote schools with computers, electricity and Internet access. It has also put social and economic development tools in the hands of the communities in which the schools are located. Just to reach these isolated schools proved to be a logistic challenge. In some locations, the project team had to use a helicopter, four-wheel drive vehicles and even carts pulled by oxen to carry materials. They had to ford rivers, cross a large lake by ferry, and climb steep slopes that were thick with mud because of the heavy rains. It was all worthwhile.*

Through its "Connect a School, Connect a Community" initiative, ITU aims to ensure that all people have access to information and communication technologies (ICT) and to the applications these technologies offer. To achieve that lofty goal means ensuring that people living in urban, rural and isolated areas are able to use ICT. This implies making every effort to provide ICT access to disadvantaged and vulnerable groups, including women, persons with disabilities, children and youth, and indigenous peoples.

In Nicaragua, ITU has helped to connect five model schools in different terrains, including one that is so remote that computers had to be dragged up dirt trails by ox-cart. Children in that remote location are delighted

to be using computers and accessing the Internet for the first time.

It all started with a cooperation agreement between ITU and the Nicaraguan regulatory authority, the Institute for Telecommunications and Posts (TELCOR). ITU committed to cooperating in devising a draft national school connectivity plan for Nicaragua and to conducting a pilot project for connecting public schools and enabling them also to function as community centres using different networking technologies.

## Preparing Nicaragua's plan

There are 8154 primary and secondary schools in the public school system in Nicaragua, and a national school connectivity plan has to take account of the number of children attending those schools, the location of the schools, as well as the availability of Internet access for the schools.

First, a review was carried out of policies and regulations in force in the telecommunications sector in terms of their impact on facilitating Internet access. This was followed by an analysis of the policy and regulatory elements that would enable better provision of connectivity to schools than that offered before the project started.

Based on this analysis and on the situation of the telecommunications sector in Nicaragua, it was recommended that a national school connectivity plan should be implemented in stages. Potential policy approaches that could be adopted at the highest government level might include steps to:

- eliminate value-added tax for Internet service for schools;
- set preferential rates for the educational sector;
- impose conditions on companies before granting or renewing concessions for the use of frequencies, requiring companies to provide Internet service to schools at no cost or at preferential rates;
- promote the reduction of prices for international connectivity for Nicaraguan operators, to be reflected in lower prices for customers;
- auction spectrum that is not in use, on the condition that the licensee provides connectivity to schools at no cost, for the duration of the licence;
- use the proceeds of the Telecommunications Investment Fund (FITEL) to provide Internet services to schools and to finance the purchase of equipment needed to serve this purpose.

## Pilot project connects schools as community centres

The pilot project was launched in July 2010, when ITU expert Claudia Gómez Costa travelled into the interior of the country. She spent more than two months there and, in collaboration with government authorities, selected the schools that would be part of the project, carry it through and become community centres. Initially, two schools were to be connected. ITU and TELCOR worked together as a dynamic team, with the result that the project exceeded TELCOR's expectations. Careful management of project resources and additional resource mobilization enabled ITU to connect three more schools than the two originally planned.

Ms Gómez Costa explains, "The schools to be connected as community centres were all in Rivas department and were selected on the basis of two criteria: their geographical location and the feasibility of Internet access. The aim was that the schools connected using

various technologies under the pilot project could then be held up as models for the vast majority of schools in Nicaragua which have not yet been connected to the Internet."

As the technical experts and lead trainers worked alongside teachers, students and parents, and shared journeys, meals, intensive training activities and rest periods, they developed bonds which kept them focused on following through the project. This created a level of energy that drove everyone to move forward and achieve a common goal.

By the end of the project in December 2010, each school was equipped with 20 computers. Of the 100 computers distributed, 60 were provided free of charge by ITU as part of the project and 40 were donated by Intel Corporation. The Claro-Enitel Corporation offered free Internet connectivity for the five schools for one year.

A total of 98 teachers in rural schools were trained in ICT. Each school — acting as a community centre — received four hours of training on site and four hours online, once a week for five weeks. A total of 921 students and 2923 people in the communities where the five schools are located are benefiting from the project.

Commenting on this achievement, Brahima Sanou, Director of ITU's Telecommunication Development Bureau said: "I'm delighted with the success of this project in Nicaragua, which shows what can be achieved when ITU and its Member States work together to connect schools. We are supporting ITU Member States in a variety of countries to develop National School Connectivity Plans, model schools and school-based community ICT centres. I encourage all ITU Administrations to take the necessary steps to connect their schools by 2015 in line with the goals set by world leaders during the World Summit on the Information Society. "

*All photos in this article were provided by Claudia Gómez Costa.*

## The schools

*The Pedro Joaquín Chamorro School is situated 16 kilometres from San Juan del Sur in Genízaro — a rural area with semi-urban characteristics, located beside a paved highway and easy to reach. A fairly conventional 3G connection with a Yagi antenna for signal gain was used for the Pedro Joaquín Chamorro school. The teachers were thrilled when they learned that their school had been selected, and were enthusiastic about undergoing training to ensure that this new resource would be properly managed as a teaching tool.*

*The school is very close to the community of Torovenado, and together with six other schools constitutes the local rural school district. The teachers at the Pedro Joaquín Chamorro School said that it would be fantastic if teachers at the other schools in the district could be trained as well. This initiative was heartily supported by the Ministry of Education representative because it means that trained teachers from the satellite schools can take their students and their students' parents to the Internet-connected school to gain experience in using the Internet for learning purposes.*

*Another conventional technology, a canopy antenna installed on top of a water tank, was used for the Fidel González School in Cárdenas, a municipal district in Rivas department near the Costa Rican border on the shore of Lake Nicaragua, 145 kilometres south of Managua. Cárdenas is a rural area with some urban characteristics, and the community is accessible by a paved road. The road passes through a wind farm of 19 turbines generating electricity.*

*The teachers at the Fidel González School considered that the school's high enrolment and the fact that it offered secondary education, as well as pre-school and primary education, were compelling arguments in favour of an Internet connection and access to ICT for learning purposes. Natalie, a schoolchild, says "We can work on the Internet right here. We will not have to pay extra to get the information we need for schoolwork. It is brilliant!" Also, the community wants to use the new Internet connection to promote tourism and gain access to rural extension programmes.*

*The Francisca Hernández School is in El Ostional, a tiny fishing village 21 kilometres south of San Juan del Sur. The school is truly the heart of the community. The road to El Ostional is not always passable. When it rains a lot, the road — which is a muddy dirt road built on a base of crushed rock — gets washed out by the overflowing rivers and creeks that cross it. The residents talked to the project team about their fishery and their hope of starting a tourism campaign. Connecting the community was paramount, right from the beginning. Because of the school's remote location, it was decided to use very small aperture terminal (VSAT) technology to provide Internet connection. Teachers said that they had never thought it would be possible to have the Internet in their village. When the schoolchildren were asked whether being able to work on a computer is a good thing, the answer was a resounding "Yes!"*

*The Andrés Castro School in Tichaná is at the foot of the Maderas volcano at the southern tip of Ometepe island, in the Altagracia municipal district. The school is close the highway that connects Santa Cruz and San Pedro, and together with three other schools along the island's coastline up to Mérida constitutes the local rural school district.*

*Getting to the school requires taking a ferry from the mainland across Lake Nicaragua to Puerto Moyogalpa on the island, and then travelling the rest of the way by road. Part of the road is very good, but then it becomes extremely rough. During the rainy season, several sections of the road are flooded and only an off-road, four-wheel drive vehicle can make it through. Again, because of the school's remote location, the Internet connection used VSAT technology.*

*The teachers immediately saw the benefits of their school having an Internet connection, because it gives their students*

*a chance to move on to secondary school. In the tiny community, the highest level of formal education available is primary school. The mother of one student suggested very shyly that she might get together with other mothers to use the Internet to find ways to improve their plantain crops and market their handicrafts.*

*The Francisco Morazán School in Panzuaca, Tola, was the fifth school selected, and getting it included in the pilot project was one of the most gratifying aspects of the entire exercise. The rural, scattered community of Panzuaca sits in the middle of the dense Tola jungle, 125 metres above sea level. Starting from the town of Rivas, the capital of Rivas department, Tola can be reached by a paved road. To get from Tola to the school means following a roiling river and walking two hours through the jungle or riding on mule-back. At Panzuaca, school meant pre-school or primary classes held outdoors or under leaking roofs for 30 or so children. There was no electricity and there were no generators, so solar panels had to be installed along with the VSAT technology.*

*Community groups built the classroom. The Mayor provided the materials, while the community provided the ox-carts needed to transport them. In spite of inclement weather and poor road conditions, doors, posts, bricks and sheets of plywood were all brought to Panzuaca, and within a week the classroom was ready.*

*The VSAT antenna took seven hours to reach Panzuaca by ox-cart. The entire community helped to install it. Men cut utility poles to support the antenna and dug holes for the guy-wires. Women carried bags of heavy stones up from the river, and one of the ox-carts was used to help brace the antenna during the installation.*

## The impact

By the end of the project, people were already using ICT confidently and successfully. Access to the Internet will certainly contribute to their economic and social development, and will enhance their quality of life. Students are now comfortable using e-mail, chat and videoconferencing, searching for and using information on school subjects (mathematics, languages, science, social studies, art and so on), creating their own blogs, and publishing their own experiences.

José Pablo de la Roca, TELCOR Director of Planning and Development, who was the national focal point of the ITU project, says: "The 'Connect a School, Connect a Community' project, executed by the International Telecommunication Union and the regulator TELCOR in collaboration with the Ministry of Education, provided the opportunity for the five beneficiary communities to access information and knowledge, with technology harnessed for productive, social purposes of particular benefit to the youngest generation. The project also made it possible to map out a route for connecting schools at national level, identifying various major challenges such as financing, the need to tighten the ties of collaboration between the public and private sectors, the cultural change in the use of technology, and the importance of developing human capacity at local level."

On a wider scale, the National School Connectivity Plan developed by the project was well received by TELCOR, which has indicated that it will use the plan as a foundation for providing Internet connectivity for the majority of Nicaraguan public schools. As José Pablo de la Roca says, "The project has taught us valuable lessons, such as the possibility of using different technologies for urban and rural areas in future projects; the need to decentralize technical and teaching assistance at local level, since centralizing assistance makes it impossible to ensure the success of a project like this; and the requirement for public sector institutions to work together based on common objectives, in which respect we can count on a Ministry of Education that takes advantage of ICT to improve education and a regulator committed to making sure that everyone has access to ICT."

Along with proper training, these school-based community centres equipped with ICT are starting to open up a new world. Web-based activities can be carried out among groups of schools. The community can take advantage of training opportunities, and enjoy the ability to produce local content, promoting the community's own culture. Clearly, the Nicaraguan project could serve as a model for other developing countries.

*For more information on the Connect a School, Connect a Community initiative, please visit www.connectaschool.org*


# Connecting your world.

## For over 135 years, AT&T has been innovating and investing to improve the way people communicate.

With one of the world's most advanced global network backbones, we now carry 27.4 petabytes of data on an average business day.

And through advancements like telepresence and cloud computing, our business customers on six continents are utilizing new platforms to increase productivity and reduce their environmental impact.

Innovations like these prove what's possible when rules and incentives are right. Capital flows, jobs are created, new technologies flourish, and consumers benefit from the power of choice and competition.

*Join us at www.attpublicpolicy.eu to talk about issues that will define our economic and social progress in the 21st century.*

www.attpublicpolicy.eu

at&t

AFP

# Social media

## Confronting the regulatory challenges

*With more than one billion social network users, social networking platforms now represent a crucial part of the Internet ecosystem and one that requires a forward-looking strategy from regulators worldwide.*

*Unlike Facebook, Twitter and LinkedIn — and Google Plus, which launched in June 2011 and quickly amassed tens of millions of users — many social networks have created huge localized communities with limited international interaction (see box).*

*This article is adapted from a Discussion Paper to the Global Industry Leaders' Forum 2011. The paper is entitled "Confronting The Social Media Regulatory Challenge", and was prepared by Michael Geist, Canada Research Chair in Internet and E-commerce Law, University of Ottawa, Faculty of Law.*

### Facebook

In less than five years, Facebook has grown to over 750 million active users worldwide, with more than 70 per cent of them residing outside the United States.

The average Facebook user has 130 friends, is connected to 80 community pages, groups and events, and creates 90 pieces of content each month. More than 30 billion pieces of content are shared each month, and more than 250 million active users accessing Facebook through mobile devices such as smartphones.

Entrepreneurs and developers from more than 190 countries build with Facebook Platform, and users instal 20 million applications every day. More than 2.5 million websites have integrated with Facebook, including more than half comScore's Global Top 100 websites.

### *Social media sites with localized users*

- *QQ (China)*
- *Vkontakte (Russian Federation)*
- *Mixi (Japan)*
- *Orkut (Brazil, India, and Paraguay)*
- *Hi5 (Colombia, Ecuador, Peru)*
- *Friendster (Philippines)*
- *Iwiw (Hungary)*
- *Cyworld (Republic of Korea)*
- *Hyves (Netherlands)*
- *Nasza-klasa (Poland)*
- *Lidé (Czech Republic)*
- *One (Lithuania)*
- *Draugiem (Latvia)*
- *Zing (Viet Nam)*
- *Skyrock (France, Belgium, Senegal)*
- *Studiverzeichnis (Germany, Austria)*

## Twitter

Twitter has grown to more than 200 million users since its launch in July 2006, adding 460 000 new users every day. Users send more than 200 million tweets daily. In the United States, 38 per cent of users access Twitter from their mobile devices.

There is significant economic activity surrounding Twitter, with more than one million registered Twitter apps connecting to the service. Many software programs and third party services enable direct access to Twitter discussion, without requiring a visit to the Twitter.com website.

## LinkedIn

LinkedIn has approximately 120 million users, about half of whom reside in the United States. Other countries with numerous LinkedIn users include Brazil, India, and the United Kingdom. The site is currently growing fastest in Latin America and Africa.

In April 2011, LinkedIn opened up full access to the LinkedIn platform to developers. A number of new plug-ins were introduced, including the LinkedIn Share Button, which more than 100 000 publishers are now using to drive traffic to their sites.

## How regulators are using social media

A number of regulators are already using social media as a way of delivering their information quickly and authoritatively to interested parties. The absence of a social media communications strategy could fuel criticism of the regulator as resisting change or being out-of-touch.

Some regulators use Twitter as a secondary form of press release, while others use it for more interactive purposes. For example, the United States Federal Communications Commission (FCC) Twitter account actively forwards interesting content ("retweeting"), promotes agency developments, and encourages public participation in contests and other activities. The FCC account, with more than 435 000 followers, is the largest of any telecommunication regulatory agency in the world.

Another example is the use of Twitter by the Canadian Radio-television and Telecommunications Commission (CRTC) to provide its hundreds of followers with near-instant access to document submissions during live hearings on wholesale Internet access. Commission officials responded — in English and French — to real-time queries.

The Telecommunication Regulatory Authority (TRA) of Bahrain launched its Twitter presence in April 2011 as part of an initiative to promote openness and transparency. TRA noted "the usage of social media such as Twitter is growing tremendously as it is complemented by the affordability of the broadband services in Bahrain". TRA Twitter presence quickly garnered hundreds of followers.

Other regulators with Twitter accounts include the Australia Communications and Media Authority, the Communications Commission of Kenya, the Malta Communications Authority, and the United Kingdom's Ofcom.

Facebook has also developed into an important social media tool for telecommunication regulators. The Australia Communications and Media Authority uses Facebook to update users on forthcoming events and to advise the public on consumer protection, The Facebook page is open to the public, and is integrated with offline access, providing information on customer call centres and office opening hours. The Communications Commission of Kenya uses its Facebook page in much the same way. The page includes posts to recent press releases, YouTube videos, and photos. As an open page, it also gives visitors the ability to post their questions directly to the Commission

YouTube has emerged as a popular service for regulators with a public education mandate. For example, the United Kingdom's Ofcom maintains a large YouTube page with dozens of videos providing guidance on how the public can file complaints or exercise consumer rights. The featured videos also include press conferences and public presentations. The page was launched in 2006 and its videos have received nearly 150 000 views. Several regulators also make use of Flickr to post a steady stream of photographs. For example, the FCC page draws from Commission meetings and public events.

The use of these services supplement increasingly robust regulator websites that frequently incorporate social media widgets and functionality. In addition to conventional regulatory documents and agency information, regulator sites now often include less formal blogs and microsites designed specifically to engage with the public.

## How stakeholders use social media to influence regulators

Many stakeholders now turn to social media in an effort to influence public opinion, engage in digital advocacy, and promote their preferred regulatory outcome. From major political events in the Arab States to


AFP/XINHUA

modest telecommunication policy issues, stakeholders on all sides have used social media as a mechanism to galvanize popular support.

From a grassroots perspective, one of the best-known groups is Free Press, a United States national, nonpartisan, nonprofit organization working to reform the media. Formed in 2002, Free Press has grown into the largest media reform organization in the United States, with nearly half a million activists and members and a large full-time staff. Its activist tools include a presence on Facebook, Flickr, MySpace, Twitter and YouTube

Many smaller groups use social media to "punch above their weight." In France, La Quadrature du Net (Squaring the Net) has emerged as a vocal opponent of European Union telecommunication reform, as well as of efforts to enforce international intellectual property rights. Although the organization has only a handful of staff, it has been able to influence the political and regulatory process by using the Internet to encourage widespread participation and political advocacy.

Open Media, a virtually unknown group just a few years ago, played a crucial role in stirring Canadian consumer sentiment on telecommunication matters. In early 2011, more than 450 000 Canadians signed an Open Media petition calling for an end to usage-based billing. The petition was widely promoted on Facebook, Twitter, and other social media, and provoked a reaction from the Canadian government.

## Social media and telecommunications regulation

Social media are not synonymous with telecommunications, although social networking services frequently incorporate telecommunications functionality into their services. For example, Facebook recently announced an agreement with Skype that allows its users to effortless shift to voice discussion with friends on their Facebook network. Similarly, Google+ builds in the Google Voice product so that connected users can easily conduct voice or video chats from within the social network environment.

Some telecommunication regulators, for example the Bahrain Telecommunications Regulatory Authority (TRA), have established guidelines for the use of social

media. TRA directs users to refrain from posting, forwarding or retweeting messages that are untrue, extremist, violent or pornographic. TRA is trying to apply journalism standards to social media. Reputable journalism operates under a code of ethics (verifying content and protecting viewers from offensive images) but this is not the case with social media broadcasting.

## Blocking access to social media

Many regulators have taken steps to block access to social media sites — often temporarily — in response to a particular incident or piece of content. For example, the Pakistan Telecommunication Authority and the Bangladesh Telecommunication Regulatory Commission blocked access to Facebook because of unacceptable images. The Uganda Communications Commission directed Internet service providers to temporarily block communication on social networking sites including Facebook and Twitter in April, 2011 in response to growing unrest. In March 2011, Twitter was blocked in Cameroon in an effort to prevent the opposition from engaging in Twitter activism. Twitter was also blocked in January 2011 in Egypt in an effort to stop protesters from using the site to organize and to get information out to the public. Thailand blocked access to YouTube in response to a video insulting the King.

## Privacy and data protection

Long-standing privacy norms are being increasingly challenged by the massive popularity of social networks that encourage users to share information that in a previous generation would never have been made public.

Privacy experts have argued that social media companies make it difficult for users to protect their privacy by establishing open privacy settings as the default. Facebook and other social media sites give users the ability to adjust those settings, yet the default settings have steadily pushed users towards greater openness.

The best known social network privacy enforcement action occurred in Canada, where the Privacy Commissioner of Canada conducted a lengthy investigation into Facebook's privacy practices in 2008–2009. The Commissioner ruled against Facebook on several counts. For example, the Commissioner identified a lack of information about third-party applications, making too much personal information available to third-party developers without Facebook monitoring, inadequate disclosure to users about what was being disclosed, lack of user consent, and lack of user control over personal information.

The Canadian commissioner also raised concerns about account deactivation, where the account is effectively retained but inaccessible to the public. The Commissioner noted that "the longer an account remains deactivated and the information in it unused, the more difficult it is to argue that retention of the user's personal information is reasonable for the social networking purposes for which it was collected." Further, the Commissioner expressed concern that the difference between deactivation and deletion is insufficiently clear.

In the Republic of Korea, the Korea Communications Commission has requested increasing privacy measures from Facebook. If personal information is provided to a third party, Facebook needs to notify users of the purpose and the period in which the details will be used. Facebook was also asked to show how it uses personal information for customized advertising and whether it is complying with measures to protect personal information.


In 2010, the German Data Protection Authority required Facebook to modify its Friend Finder application. Facebook agreed to inform users that, if they upload their electronic address books to Friend Finder, Facebook will store the information contained in such address books, and may use this information to generate e-mail solicitations to join Facebook. Facebook also agreed to include a clearly-displayed opt-out link in its unsolicited e-mail messages, and will no longer include photographs from user profiles in such messages.

In launching Google Buzz, Google automatically assigned users a network of "followers" from among people with whom they corresponded most often on Gmail. This action attracted the wrath of users and privacy advocates. Google quickly altered the offending features but regulators were alerted to the privacy concerns raised.

In 2011, the United States Federal Trade Commission (FTC) forced Google to implement a comprehensive privacy programme and undergo independent privacy audits for 20 years to protect consumers, Buzz having violated the FTC Act.

The European Union has attempted to address the general problem of data protection by establishing restrictions on the export of data, requiring that data transfers be limited to those countries with "adequate" privacy protection. Canada has adopted a different approach, eschewing restrictions on data exports but holding organizations accountable for the data they collect, regardless of its location.

In 2011, the FTC reached a settlement with Twitter following privacy breaches. Twitter is barred for 20 years from misrepresenting to consumers the extent to which it protects the security, privacy and confidentiality of nonpublic consumer information. Twitter has had to establish an information security programme to protect the security, privacy, confidentiality and integrity of nonpublic consumer information. The programme will be assessed by an independent third-party auditor every other year for 10 years. Twitter is also required to maintain and report its privacy practices and policies.

# Official Visits

*During the months of August and September 2011, courtesy visits were made to ITU Secretary-General Hamadoun I. Touré by the following ministers, ambassadors to the United Nations Office and other international organizations in Geneva, and other important guests.*

## August »

Abdi Houssein Ahmed, Djibouti's Minister of Communications was received by Brahima Sanou, Director of the ITU Telecommunication Development Bureau on behalf of the Secretary-General

## September »

Soline Nyirahabimana, Ambassador of Rwanda

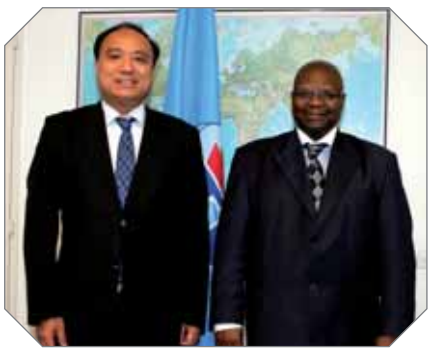
Moncef Baati, Ambassador of Tunisia

*All photos are by V. Martin/ITU and P.M. Virot/ITU.*

Mohamadou Arabani Saibou, Director General of the Ecole Supérieure Multinationale des Télécommunications — ESMT (Multinational Higher School of Telecommunications/ICT) based in Dakar, Senegal

Dr Ekwow Spio-Garbrah, during his farewell visit as Chief Executive Officer of the Commonwealth Telecommunications Organisation (CTO)

Roberto Flores Bermúdez, Ambassador of Honduras



ITU Deputy Secretary-General Houlin Zhao with Obed Bapela, South Africa's Deputy Minister of Communications

Mikhail Kritsky, Deputy Director General at Svyazinvest, Russian Federation

Mikhail Khvostov, Ambassador of Belarus

Léopold Ismael Samba, Ambassador of the Central African Republic

Saudi Telecom delegation (from left to right): Nasser Al-Garni, ITU Relations Manager; Dr Mahmoud Abdulkarim Al Khatib, Vice President for Regulatory Affairs; Dr Saad Dhafer Al Qahtani, Group CEO for Strategic Operations; Dr Hamadoun I. Touré, ITU Secretary-General; Dr Abdullah M. Alhomeadan, Vice President for Human Capital; and Ali Alomari, Head of International Affairs

Photo credit: Shutterstock®

# WORLD RADIOCOMMUNICATION CONFERENCE 2012

## GENEVA, 23 JANUARY – 17 FEBRUARY 2012

www.itu.int/ITU-R/go/WRC-12

# ITU NEWS Magazine

## Tells you what's happening in telecommunications around the world

*Every time you make a phone call, use a mobile, use e-mail, watch television or access the Internet, you benefit from the work of ITU's mission to connect the world.*





**Advertise in *ITU News* and reach the global market**


For advertising information, contact:
International Telecommunication Union
ITU News
Place des Nations
CH–1211 Geneva 20
Switzerland
Tel.: +41 22 730 5234
E-mail: itunews@itu.int
www.itu.int/itunews


Committed to connecting the world

# BE THERE

**BE SEEN. BE HEARD. BE PART OF THE WORLD'S MOST INFLUENTIAL ICT EVENT.**

**GENEVA, OCTOBER 24-27, 2011**

ITU Telecom World has changed. More discussion. More debate. More opportunities to network. More forward looking and forward thinking. More influential people. More reasons for you to be there.

www.itu.int/world2011

ITU TELECOM WORLD '11