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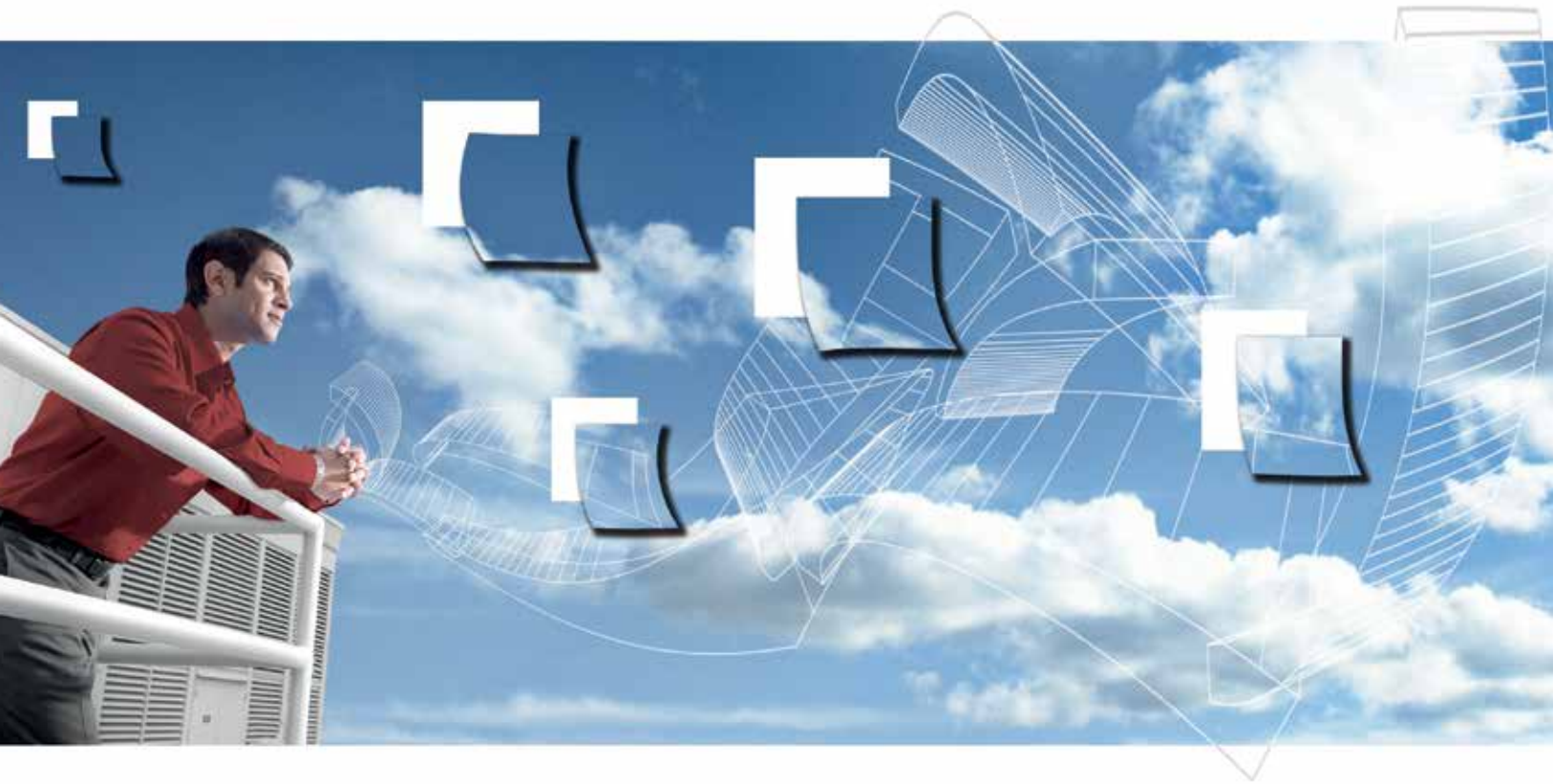
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Open talks with ITU Secretary-General

Dr Hamadoun I. Touré

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As part of my commitment to ITU's membership, I am pleased to announce the launch of a series of informal consultations — called "Open talks" — which I will host on Internet-related public policy issues. The talks will include the topic of the role of governments in the multistakeholder model of Internet governance. I will bring the essence of these talks to the ITU Council Working Group on international Internet-related Public Policy Issues in November 2013 for information.

I am proud of ITU's substantial and diverse membership — 193 Member States and around 700 Sector Members, including members of the Internet community, industry, civil society and academia. ITU members from different regions and different perspectives continue to work together for the common good and in the public interest to resolve complex and challenging issues.

Not everyone has the opportunity to participate in discussions at ITU. That is why, as ITU Secretary-General, I constantly seek different ways of reaching out to engage all those whose ideas could make a difference. No one person, no single group or institution, no individual country has a monopoly over good ideas. As history has reminded us time and again, the brightest minds can be found anywhere.

Everyone's views and opinions should be heard and accommodated in global Internet-related policy-making, because they concern what must be considered today as a basic commodity for all the world's people.

In this regard, the multistakeholder model was recognized at the World Summit on the Information Society (WSIS) as the way forward for the global governance of the Internet. The WSIS outcome documents (Geneva 2003 and Tunis 2005) provide a set of framework principles for the multistakeholder model. In particular, a reference to the role of governments in the multistakeholder model can be found in many paragraphs of the Tunis Agenda, including paragraph 35 which outlines the roles and responsibilities of each stakeholder group.

As we approach the tenth anniversary of WSIS, I am proud that ITU continues to play its part in championing multistakeholderism and in using its convening power to facilitate constructive dialogue.

If international policy-making is to be effective and to achieve the desired impact, it is clear to me that the diverse views of all constituents must be taken into account. This is particularly true when it comes to international Internet-related public policy — which directly affects how we manage a vital global resource.

In these open talks, I will adopt informal, open and inclusive formats that provide opportunities for anyone, anywhere in the world to participate. These formats include: a World Café in the ICT Discovery at the ITU headquarters (8 October 2013), a Town Hall meeting at the Internet Governance Forum (IGF) in Bali, Indonesia (25 October 2013), and an online format through the use of an interactive crowdsourcing platform. I look forward to hearing from all of you and listening to the different ideas and perspectives that you will undoubtedly share.

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Digital communications and regulation

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ITU TELECOM WORLD '13

ITU Telecom World 2013 to focus on challenging topics

Leading lights from government and industry will join forces at ITU Telecom World 2013 in Bangkok from 19 to 22 November to explore the best and most beneficial ways to embrace change in a digital world.

"From the impact of big data or the changing competitive landscape to crucial debates on how world citizens can ensure their privacy in our digital world, the conversations at ITU Telecom World 2013 promise an in-depth exploration of the lasting impact of ICT industry change and how best to harness this for the benefit of our global society," says ITU Secretary-General Dr Hamadoun I. Touré.

Conversations taking place at ITU Telecom World 2013 will include:

▶ Regional leaders round table: Perspectives on changing business models, bringing together key regional players.

▶ The social and mobile app world — friend or foe: The impact of social media/mobile apps and what to expect next.

▶ Mobile technology and productivity in the enterprise: How can mobile apps be used to transform the way we do business?

▶ Internet of Things: The challenge of enabling future connectivity, with sound business goals and reliable platforms, for the benefit of all.

▶ The world of big data: How best to balance the needs of the individual within the global digital community. Whose rules apply to whom and what should stakeholders do differently?

Participant registration and media accreditation for the event are open.

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For more information, please visit http://world2013.itu.int/

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Protecting the world's youngest cybernauts

Remarks from Dame Patience Goodluck Jonathan

First Lady of Nigeria, and President of the African First Ladies Peace Mission

Speaking on the occasion of her investiture as the ITU Child Online Protection Champion, at the ITU headquarters in Geneva on 22 July 2013, Dame Patience Goodluck Jonathan said it was gratifying for her to be appointed to this position, which requires her to work hand in hand with ITU, the oldest agency of the United Nations system, founded in 1865. The following are extracts from her remarks.

The survival of ITU for nearly one and a half centuries is strong testimony of the overwhelming global relevance of the strategic services of this agency. It is also evidence of the corporate responsibility with which ITU has discharged its duties to the world community. ITU has kept people connected and sustained relations around the world, by offering a platform that enables people to stay close, no matter how far they are apart geographically.

The global ITU family has shown commendable resolve to intervene in the worrisome challenge of cyberspace insecurity, especially with regard to our highly vulnerable children. This is

Dame Patience Jonathan receiving the ITU Certificate of Honour from Dr Hamadoun I. Touré, ITU Secretary-General

As a passionate advocate of the well-being of women and children, I warmly welcome this opportunity to play a key role on the global stage in the fight to protect our children from unwholesome activities in cyberspace. The security of our children and youth demands — and will always demand — our best efforts, because of their strategic place in the security and prosperity of our collective future. This imposes on us the duty of continually building structures and developing strategies to shield young people from influences that have the potential of compromising the future of coming generations. In this context, ITU has taken a most commendable step to protect the world's youngest cybernauts by establishing the Child Online Protection initiative.

right and proper, because a majority of our children and youths are among the top users of cyberspace technology globally. In addition, the future of humanity depends significantly on the quality of children and youths we raise today.

It is evident that advances in information and communication technologies have provided extraordinary advantages to humankind, making life easier and contributing to the development of a well-informed citizenry. But uncontrolled access to the World Wide Web comes with risks to the well-being and safety of children and youths.

For this reason, I pledge to join hands with ITU — through its International Multilateral Partnership Against Cyber Threats (IMPACT) — to secure the children of the world from the dangers of cybercrimes.

My excitement about this assignment stems from my long-standing passion for the security, welfare and development of vulnerable groups. These especially include women and children in my country, Nigeria, as well as across the African continent. We look on this new platform as an opportunity to extend our protective responsibility to cover all children across the world.

Our sacred duty to protect our young people is in line with the global United Nations Convention on the Rights of the Child, as well as Nigeria's Child Rights Act of 2003. In this context, I joyfully look forward to working with committed stakeholders around the world, especially the Global Patron for Child Online Protection, Laura Chinchilla, President of Costa Rica.

Through the Child Online Protection initiative, we have the means to put a protective cloak over all children across the world and keep them safe from cyberthreats, enabling our young people to delight in the wonders of technology and innovate to build a better world.

I am happy to note that ITU has already put in place guidelines for different stakeholders — children, educators, industry players and policy-makers — and policies and strategies that the 193 Member States can adopt to protect our children in cyberspace.

Digital communications and regulation

World regulators and industry exchange views in Warsaw

"Fourth-Generation Regulation: Driving Digital Communications Ahead" was the theme of the 13th Global Symposium for Regulators (GSR-13), organized by ITU's Telecommunication Development Bureau (BDT), in collaboration with Poland's Ministry of Digitization and the National Regulatory Authority Office of Electronic Communications (UKE).

The symposium, which took place in Warsaw from 3 to 5 July 2013, examined challenges that regulators face in a networked and converged world, where information and communication technologies (ICT) cut across virtually every sector of society and the economy. The first two days were dedicated to the Global Regulators-Industry Dialogue (GRID) with the private sector, while the third day was for regulators alone. The event attracted 664 participants from 131 countries.

Olgierd Dziekonski
*Secretary of State in the Chancellery
of the President of Poland*

Houlin Zhao
ITU Deputy Secretary-General

Magdalena Gaj
*President of Poland's National Regulatory
Authority Office of Electronic Communications*

Opening ceremony

The meeting opened with a message read on behalf of President Bronislaw Komorowski of Poland, followed by keynote addresses from Houlin Zhao, ITU Deputy Secretary-General (on behalf of Dr Hamadoun I. Touré, ITU Secretary-General) and Ms Magdalena Gaj, President of UKE and Chairman of GSR-13.

Reading the message from President Komorowski, Olgierd Dziekonski, Secretary of State in the Chancellery of the President of Poland, said that the choice of Poland as the first country from the European Union to host the Global Symposium for Regulators was a sign of the significant changes that the country had made in recent years. ICT now account for 5 per cent of the Polish gross domestic product (GDP). The Internet is a global resource

that allows GDP growth, as well as being a symbol of solidarity among all classes of the population and a tool for freedom, he concluded.

ITU estimates that by the end of 2013, there will be as many mobile cellular phones as there are people on the planet, and that some 2.7 billion people will be using the Internet. Mr Zhao highlighted this extraordinary progress in the ICT sector, noting that the challenge now is to do for the Internet and broadband what has been achieved so successfully in mobile communications. Two things need urgent action, he said. First, governments need to ensure that broadband stays at the top of the development agenda, so that roll-out is accelerated and the benefits are brought to as many people as possible. Second, Internet

access — and especially broadband — should be made much more affordable than it is today. This is where GSR can play an important role. "For the ICT industry, good regulation delivers predictability and stability. It reduces risk. It encourages investment in ICT infrastructure and rewards competition and innovative business models. At the same time, it protects consumers, by delivering a transparent marketplace and a fair system for resolving disputes," Mr Zhao told participants.

Underlining the crucial role of regulators, Ms Gaj said their professional mission is to ensure that telecommunication services and, in particular, the Internet, are accessible to all. This access, she added, has to be considered a basic right, not a luxury. She stressed that regulators should work

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towards the common goal of enabling people of all continents and countries to enjoy the benefits of the global information society. To achieve that outcome, regulators need to adopt human-centric policies. "Telecommunication networks are the life-blood of the world's economy. Living and working without a telephone, a computer or Internet access has become unimaginable," said Ms Gaj, categorizing our human species that is increasingly dependent on mobile devices as "homo smartphonus". With only one-third of the world's population being connected to the Internet implies that nearly 4 billion people still live offline. Making this observation, Ms Gaj commented that "If everyone had a chance to access the Internet, the benefits for the global economy would be incredible."

So, today's broadband Internet services cannot be considered a luxury — they are a basic need for sustainable economic growth of the whole world. "As regulators, we have duties — but also tools — to do everything to promote broadband Internet access in our societies. This cannot be successful without the cooperation of operators," stressed Ms Gaj, explaining that dialogue with operators is necessary because next-generation networks require huge investment. "It is not what we should do for the market, but what the market should do for people with our support. Just like synapses form information highways by building connections, we have to foster connections to coexist," said Ms Gaj.

Poland itself is trying to develop solutions that suit the specific needs of the market, by proposing amendments to the law, carrying out analyses of broadband infrastructure and services, providing educational assistance to market players, and developing its own know-how based on the experience of other countries. "That is why a partnership relation among all parties of the ecosystem — the market and regulator — is necessary and is a modern approach, most suitable in the 21st century". Along with market supervision, regulators need to create demand for digital services. Often, the problem is the lack of awareness about the benefits that broadband brings. The latest report of the European Commission shows that only 2 per cent of Europeans buy broadband access with a capacity of 100 Mbit/s or faster. "This is an alarmingly low rate", she said. "And it shows the staggering amount of work ahead of us."

Brahima Sanou
Director of the ITU Telecommunication Development Bureau

Michal Boni
Poland's Minister of Administration and Digitization

Neelie Kroes
Vice-President of the European Commission responsible for the Digital Agenda

Opening debate: Building the future digital society

The opening debate took the form of an interactive session and was moderated by Brahima Sanou, Director of BDT, with keynote addresses from Michal Boni, Poland's Minister of Administration and Digitization, and Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda.

Panellists in this session were Mignon Clyburn, Acting Chairwoman of the United States Federal Communications Commission; Mohammed Al Amer, Chairman of Bahrain's Telecommunications Regulatory Authority; Anne Bouverot, Director General and Member of the Board of the GSM Association (GSMA), United Kingdom; John Davies, Member of the Broadband Commission for Digital Development; and Richard Allan, Facebook's Director of Policy for EMEA.

Mr Sanou noted how the changes taking place in the sector and in our societies, led by broadband and Internet access, have profoundly altered individual and professional behaviour. In five years, the number of active mobile broadband subscriptions tripled, cellular mobile subscriptions per 100 inhabitants grew by one-third, and Internet users increased by one billion. Many new ICT services and applications can now be delivered over the same platforms, allowing users to experience an ever-expanding variety of services and applications to serve their information, communication and entertainment needs. Policy-makers and regulators are making efforts to keep abreast of the latest market trends with the aim of bringing ICT and the experience of the digital lifestyle to all. Fourth-generation regulation is required to drive these digital communications forward.

Mr Boni said that the global digital revolution requires open and comprehensive regulations to foster investment in new technologies and protect consumer rights. Managing the Internet does not mean limiting freedom of expression, although security is an essential aspect to be considered. Digital dilemmas that need to be discussed in ITU forums include building regulatory equilibrium to ensure privacy protection and a legal framework for processing data.

Mignon Clyburn
Acting Chairwoman of the United States Federal Communications Commission

Mohammed Al Amer
Chairman of Bahrain's Telecommunications Regulatory Authority

Anne Bouverot
Director General and Member of the Board of GSMA, United Kingdom

Open and smart models are needed for participatory democracy in the future society. Digital inclusion is one of the most important objectives, and the elderly should not be forgotten. Poland has launched the Poland of Equal Digital Opportunities project. It includes the Lighthouse Keepers of Digital Poland initiative, which encourages adults over 50 years old to join the digital age, with the help of local digital champions.

Panellists considered humility, research, collaboration, transparency and review as the five key characteristics of smart regulation. A collaborative multistakeholder approach is needed, along with partnerships and self-regulation, for example through codes of conduct.

Consumer protection and privacy are becoming ever more important as more and more people gain access to the Internet and share a lot of their personal information online. Consumer control is important, and privacy guidelines have been developed, but privacy may mean different things to different people. Individuals should decide what information they want to share publicly. The right to private correspondence is recognized, but how can correspondence stay private when governments have the power to violate privacy for reasons of security? Data protection is linked to the way organizations, both public and private, regulate their use of personal data. Regulation in these cases should be neutral and transparent.

On the broadband front, panellists agreed that part of the regulator's mission is to ensure that citizens get affordable access wherever they live or work, as broadband services are rolled out around the world. According to the Broadband Commission for Digital Development, in 2009 one-third of countries worldwide had a broadband plan — this proportion has now reached two-thirds. New business models based on pre-paid broadband are emerging in countries in Africa and Asia. Universal service is being used to close the digital divide, and countries are now looking at ways to boost the use of applications. Broadband affordability is important — not only in developing countries. It was stressed that broadband should cost less than 5 per cent of average monthly income by 2015.

Participants noted that Bahrain has among the lowest prices for mobile broadband in the Arab States, with prices declining by as much as 63 per cent between 2011 and 2012. This result was achieved through a competitive economy that respects the principles of sustainability, competitiveness and fairness. Clearly, investment in broadband is needed to drive productivity. Other steps taken in Bahrain

John Davies

*Member of the Broadband Commission
for Digital Development*

ITU/R. Farrell

Richard Allan

Facebook's Director of Policy for EMEA

ITU/R. Farrell

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to extend broadband include moving to a supportive regulatory framework and from *ex ante* to *ex post* regulation, fostering enhanced and inter-platform competition, ensuring quality of service through regulation, and making market information available so that consumers can make informed decisions. Speakers commented that the mobile phone gender gap needs to be addressed.

Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda, who gave the closing keynote address, said that seeing so many people from across the globe facing up to the challenge of a changing world reminded her that Europe needs to act strategically, with an eye not to yesterday's powers — but to tomorrow's opportunities.

In Europe, businesses operate across multiple sites and multiple countries, so regulation must adapt and respond.

Ms Kroes commented that Europe, which was once the home of huge innovation in the telecommunication market, was sliding behind. But new legislative proposals are in the pipeline to bring down barriers, so that operators will find it easier to run services across borders. The European Commission, she said, is seeking a more consistent legal framework for operating across borders, more consistent products for access to fixed networks, and spectrum that is more aligned across the continent. "I want people — and businesses — to enjoy the best Europe has to offer, wherever they are, without artificial barriers. This means, with more consistent protections and quality of service; with a clear guarantee of net neutrality — one that allows innovative new services to grow; with a fair deal in Internet services, transparency and genuine choice; and with fairer prices. After all, a single market should mean

seamless service. And that means no more unjustified, unfairly high prices, wherever you roam in Europe," Ms Kroes underlined.

The networked world needs strong support from regulators. "A digital society needs the right balance of stability and flexibility, investment and innovation, competition and choice. The right regulation can definitely deliver the right balance. And equally, regulators can shake up markets, so they correspond to new, digital realities" stressed Ms Kroes, concluding that regulation should focus only on areas where it is needed, while the load elsewhere should be lightened. "That is all the more important at the moment, when our priority is not just opening up access to existing networks, but to create new ones — a transition that requires significant investment. Let's do our jobs — but let's also give the market its proper responsibility, to innovate and progress."

The sessions

In the nine sessions that followed the opening ceremony and debate, panellists and participants examined smart opportunities in traditional, as well as in new areas, as follows:

- Session I: Looking for spectrum?
- Session II: Are standards the crux of ICT businesses in today's digital world?
- Session III: Financial debate: Infrastructure 4.0 and beyond: How to attract investment and secure funds
- Session IV: Maximizing the potential of universal service funds through successful administration and management — Addressing the missing link
- Session V: Digital transactions in today's smart society
- Session VI: A world of data: The need for more IP addresses
- Session VII: Moving to the next level: New apps and new delivery platforms
- Session VIII: 4th generation regulation
- Session IX: National broadband interconnection charging.

Summaries of the discussions in these sessions are contained in the GSR-13 Chairman's report, available at: http://www.itu.int/osg/gsr13/report/. This issue of *ITU News* features summaries of two of the sessions namely, "Maximizing the potential of universal service funds through successful administration and management — Addressing the missing link" and "Moving to the next level: New apps and new delivery platforms". Other session summaries will be published in future editions of the magazine.

ITU/R. Farrell

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Best-practice guidelines

The evolving roles of regulation and regulators in a digital environment

The 13th Global Symposium for Regulators (GSR-13) held in Warsaw, Poland, from 3 to 5 July 2013, ended with the adoption of best-practice guidelines on the evolving roles of regulation in the information and communication technology (ICT) sector that is experiencing tremendous change. Leading the change are the next-generation broadband networks being rolled out and facilitating convergence of media, new market players, rapid development of smart devices, the connectivity of things (Internet of things) and people, and the growing consumer demand for always-on, ubiquitous access to ICT. Meanwhile, the arrival of new content and application providers, such as over-the-top (OTT) players, is changing the rules of the game and business practices. Add to this mix the sharp increase in data flow, rapid development of cloud services and new mobile applications, and you have truly complex ICT markets challenging the traditional role and mandate of the regulator.

Spreading the word

Brahima Sanou, Director of the ITU Telecommunication Development Bureau, nominated Magdalena Gaj, President of Poland's National Regulatory Authority Office of Electronic Communications (UKE), as Ambassador for the GSR-13 best practice guidelines. In that role, Ms Gaj will bring these guidelines to the attention of all appropriate forums.

The guidelines, highlighted below, set out the basis for "regulation 4.0". They emphasize that market players should be treated equally, and advocate "light-touch" regulation that does not impose an extra burden on operators or service providers. They foresee an expanded role for regulators, not only in stimulating service uptake, but also more generally in working towards the good of society as a whole, for example by preventing social exclusion. Finally, the guidelines focus on regulatory structure, pointing out that a changing and converging market calls for an innovative regulatory response.

Equal treatment of market players

Regulators have a critical role to play in ensuring the smooth development of the ICT sector to spur sustainable economic and social development.

In a converged environment, it is important to assess market situations in order to spot operators with significant market power and stimulate competition. Ensuring that the principles of fair, equal and non-discriminatory treatment continue to prevail will foster a level-playing field among all market players, regulated and unregulated.

Eliminating barriers to new entrants and ensuring healthy competition among players (operators, Internet providers, over-the-top providers, and so on) is one

way of promoting the roll-out of next-generation broadband networks, and access to online applications and services. Regulators can also encourage network and facility sharing through soft measures such as cross-sectoral mapping of infrastructure, enabling civil works to be coordinated. Empowering consumers to make informed decisions through the development of online tools to check speed, quality of service and price of access is a soft measure that regulators may take to foster competition.

Regulators need to ensure that unused or underused spectrum is rapidly made available, and that rules to manage interference are in place. Consideration may be given to a new generation of auctions or allocations, or permitting flexible use of spectrum. By leveraging the "digital dividend" spectrum, the footprint of mobile broadband access can be extended, while "white spaces" can be made available for unlicensed use, enabling broadband services.

Terrestrial broadcasting needs to be maintained in servicing the population. Adopting administratively simplified and flexible models such as general authorizations or unified licences, where appropriate, can contribute to facilitating market entry and stimulate competition and innovation.

The use of traffic management techniques should be monitored to ensure that these techniques do not unfairly

discriminate between market players. Regulators also need to review existing competition laws and regulations to determine whether measures such as equal treatment of players are in place to address net neutrality.

"Light-touch" regulation

Regulators need to understand all parameters at play in a digital environment to ensure affordability of access and a sufficient level of quality of service to the user, without putting an extra burden on operators and service providers.

The 4th generation regulator needs to adopt a "light-touch" approach, calling for regulatory intervention only when necessary, while ensuring that market forces work without constraints and towards innovation within the prescribed national legal environment. Regulators should continue to ensure regulatory predictability and foster co-regulation (for example, voluntary standards) wherever possible, facilitating the adoption of a regulatory solution collectively developed and administered by the regulator and the industry.

Regulators should work with other interested stakeholders to reduce or remove barriers to broadband infrastructure rollout. Regulation should ensure the sustainable development of the ICT sector that is essential to attracting the investment needed in a global digital environment.

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Regulators have a role to play in building consumer trust and protecting security of services by appropriately addressing data protection, privacy issues and cybersecurity matters

Stimulating service uptake

Stimulation of service uptake and access to online services and applications requires flexible regulatory approaches. Governments should work collaboratively with all stakeholders — and in particular with the industry and regulators — to facilitate and support the development of infrastructure and provision of services, particularly in rural, un-served and underserved areas.

From the supply side, predictable and stable regulations are needed to maintain effective competition and drive the development of innovative services. In particular, regulators should modernize universal service programmes to extend broadband to the un-served and underserved, notably through a redefinition of the scope of universal service.

From the demand side, measures such as deferring or altogether discouraging heavy or special taxes on ICT equipment and services, encouraging research and development, and endorsing special programmes to stimulate e-literacy will result in higher penetration, increased demand and better social inclusion, and contribute to national economic growth. Governments and regulators have a key role to play in promoting and increasing awareness of the use and benefits of ICT.

Social inclusion

The regulator has a critical role to play in advising governments when preparing policies on development and social inclusion. Regulators can also act as a partner for ICT development and social inclusion by facilitating (and sometimes creating) partnerships with aid-donors, governments, ministries and non-governmental organizations, in particular to meet universal access goals for rural, remote and unserved areas and for people with special needs.

Regulators can establish partnerships with schools and local communities through projects that would improve the connectivity of such schools and communities and enhance their use of ICT applications. Regulators may also use voluntary, strategic partnerships to bring comprehensive (for example, connectivity, literacy training and equipment) solutions to low-income consumers, and to ensure that persons with disabilities have access to new broadband technology, applications and services.

To encourage uptake, governments and regulators may facilitate access to low-cost hand-held broadband-enabled mobile devices, allowing citizens to access web applications.

Reactive autonomous regulators

As new technologies and services emerge and converge, governments may consider establishing converged regulatory institutions or adapting their structure to reflect the changes in ICT markets. Furthermore, to respond to the transnational and interconnected nature of the converged digital ecosystem, there is a need to make regulatory structures more reactive and flexible.

To perform their role in encouraging innovation, future growth and sustainable development, regulators need to be granted sufficient flexibility and autonomy in decision-making and in enforcing legal and regulatory instruments. There is a need for regulators and their staff to keep abreast of the latest technical developments to address matters such as Internet Protocol (IP) interconnection and charging mechanisms, and IPv4 to IPv6 transition.

Regulators have a role to play in building consumer trust and protecting security of services by appropriately addressing data protection, privacy issues and cybersecurity matters. This could be done by strengthening cooperation with other government agencies at the national level,

and by collaborating with other regulators and other partners at the regional and international levels. Regulators are encouraged to make available online both sector information and the smart regulatory approaches they have adopted.

The full text of the guidelines is available at: http://www.itu.int/en/ITU-D/Conferences/GSR/Pages/GSR13-Consultation.aspx

Bahrain to host Global Symposium for Regulators in 2014

In 2014, the Global Symposium for Regulators (GSR-14) will be held in Bahrain. Mohammed Al Amer, Chairman of Bahrain's Telecommunications Regulatory Authority and Chairman of GSR-14 invited all participants to next year's event. The following topics were proposed for discussion at GSR-14:

■ Over-the-top players and net neutrality

■ Regulatory impact assessment — learning from OECD guidelines

■ Review of the structure of the Global Regulators-Industry Dialogue (GRID) and the length of both GRID and GSR meetings

■ Consumer protection in the context of technological development, migration from analogue to digital broadcasting and the needed regulatory framework

■ Convergence and innovation — which business models?

■ How regulators can contribute to enhancing competition between operators

■ Leveraging existing ITU databases and tools to facilitate and assess regulatory tools

■ How developed countries can assist developing countries in addressing regulatory challenges in dealing with advanced technologies

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- Converged regulators and regulation, in particular in the area of content and the merging of broadcasting and telecommunications
- Converged services — how to regulate cable service provision
- Universal access — how to use the funds and subsidies collected through universal service funds
- Development of a manual to help countries in setting up universal service funds
- Establishment of mechanisms to evaluate conferences.

Speakers at the closing session stressed that both cable operators and broadcasting regulators should be part of the GSR discussion, and that training for regulators is needed as a way of achieving tangible results. There was general agreement that it is important to continue discussing convergence of regulatory bodies, and for regulators to take a coordinated approach because they regulate operators that are often present in many markets. New monopolies may arise from convergence or mergers between players, in particular in the area of broadcasting and media groups (content and copyright). Exclusive transmission rights, for example for football games, can kill competition. This type of situation should be discussed, while at the same time looking into the kind of international cooperation that already exists.

New apps, new delivery platforms

"Moving to the next level: New apps and new delivery platforms" was one of the sessions of this year's Global Symposium for Regulators (GSR-13). The following article captures highlights from the debate.

Converging delivery of content

"In the past, broadcasting was mainly terrestrial, which we all knew: the television set that we watched in our homes. In recent times, new media have crept into that space, where people are actually watching or receiving broadcasting through the Internet. Increasingly, the devices we use these days, whether television (which, apart from being audiovisual, can now serve as radio and Internet) or smartphones (which also have the capacity for video, radio, voice and so on), are pretty much converging in terms of the services they offer us, and the medium used to offer these services," said Paarock VanPercy, Director General of the National Communications Authority of Ghana, opening the session, which he moderated.

There is no longer a clear distinction between network operators, on the one hand, and broadcasters, on the other. Instead, there is now a range of players active across multiple parts of the value chain, from content creation, to connectivity, to device manufacturing. Consumers are able to access whatever content they want, whenever they want. Content is also increasingly being bundled together with telephony and broadband services, through so-called triple-play or even quadruple-play offers. This converged environment poses new challenges for regulators.

Digital broadcasting and online content delivery

Presenting the GSR discussion paper on digital broadcasting and online content delivery, John McInnes, Senior Associate at Webb Henderson, asked what the threshold should be for regulatory intervention. "Given the speed of technological change, it is important that regulation is sufficiently flexible to be able to keep pace. One way of achieving this is by introducing technologically neutral licensing, so that regulation does not act as a barrier to change. Another option is to move away from detailed regulation to a more principle-based framework, which gives flexibility to adapt to change," he said.

Mr McInnes asked whether over-the-top (OTT) services — which include e-mail, voice over Internet protocol (VoIP), video-on-demand, e-commerce and online advertising — should be regulated. One argument in favour of regulation in this area is that it would level the playing field for telecommunication operators, who remain subject to very detailed regulation in most countries. But given the global nature of the Internet, how and by whom should regulation of over-the-top services be enforced?

There is also the matter of access bottlenecks. In most countries with established regulatory regimes, there are already well-developed rules on ensuring access to telecommunication networks in order to promote competition. However, there has been very little regulatory intervention to date to deal with other potential access bottlenecks, for example access to premium content. An important question for regulators will be whether competition and merger-control laws are sufficient to prevent new access bottlenecks emerging.

A key focus for regulators in the converged environment is consumer protection. Different regulators currently diverge in their approach to content regulation, perhaps reflecting different national concerns and priorities.

The increasing use of online content services means that there is an ever-increasing amount of data available to network operators and over-the-top service providers about consumer usage habits. Regulators need to decide what control there should be over the use of these data, what degree of transparency should be given to consumers about how their data may be used, and how user consent should be applied in practice.

Another hot topic for regulators is net neutrality. Essentially, this is the principle that all Internet traffic should be treated equally. The explosion in online content consumption places huge demands on telecommunication networks, and potentially offers incentives to discriminate between different sources of Internet traffic. All operators have traffic management policies, but at what point do these impinge upon net neutrality? Is it necessary to regulate to protect net neutrality?

In the new converged environment, is it still appropriate to have separate systems of regulation and regulators? There are advantages, for both licensees and consumers of converged regulators, according to Kathleen Riviere-Smith, CEO of Utilities Regulation and Competition Authority of the Bahamas, and one of the panellists. She said that moving from separate regulators to a converged regulator in the Bahamas had been beneficial but had also presented challenges.

Ms Riviere-Smith explained that "As a converged regulator — with utilities, competition and content under our purview — we are the single authority that deals with the issue. It is better for the licensee and for consumers, because at the end of the day we can look at the issue holistically versus, say, three different regulators looking at one issue, and not necessarily coordinating and collaborating with each other, and sometimes making contradictory decisions."

Regulating content?

Regulating content and regulating the medium are two very different tasks. One speaker from the floor told participants how, as a manager at a radiocommunication regulatory authority, he had responded to a request to open a radio station. "I was in charge of frequency management, so I allocated frequencies to the group of associations that had made the request. One week after the opening of the radio station, the radio broadcasts began to attack the government and criticize the

head of State. At once, the head of cabinet came into my office and asked me to ban the radio station because the content was unacceptable. I replied 'I do not manage content, only the medium. It is not possible for me to prohibit people from saying what they think. There is content and there is the medium. I have allocated the frequency. If the group does not pay, I will take away the frequency. But as for the content: go to the Ministry of Information. It is their job to deal with the content.'"

Regulators certainly face a challenge in dealing with content, said Ms Riviere-Smith, noting that "It is a lot easier to deal with network issues and network problems, than with content issues and content problems, because when it comes to networks it is quite easy to draw the boundaries, but when it comes to content it is a whole new ballgame."

Panel member Carlos Raúl Gutiérrez, President of the Board of Costa Rican telecommunication regulator, SUTEL, and President of the Latin American Forum of Telecom Regulators, REGULATEL, pinpointed another of the challenges that regulators now face, asking "Under these converged conditions, how do regulators protect the personal data of consumers,

including health data? How do they protect consumers in terms of the quality of the connection they are getting?"

Another panel member, Mohamed Sharil Tarmizi, Chairman of the Malaysian Communications and Multimedia Commission (one of the world's first converged regulatory authority), commented that content censorship is something new for telecommunication regulators. "It is virtually impossible to block something coming from outside your jurisdiction. But there is always a line that can be drawn. And that is to follow the laws of your land. For example, in Malaysia, pornography — particularly child pornography — is not allowed. And we block those websites," he said.

There is a fine line between civil liberties and individual rights, content censorship and content regulation, and respect for the laws of the land. Regulators continuously struggle to manage these aspects in the context of technological convergence.

In order to conform to a country's laws, it may sometimes be necessary to block content. Child pornography is something that all are in agreement on blocking. But where does incitement to hatred or violence fall in the spectrum of censorship

versus freedom of speech? Ultimately, freedom of speech is vital, but it must come paired with responsibility.

The challenge for the regulator is how to manage the content available on new apps and new platforms. In Malaysia, for example, traditional print media are more heavily regulated but, for the new online media, a lot of the regulation is passed over into the hands of the consumer or the user. At the end of the day, it is a question of balance.

In the United Kingdom, the self-regulation model has worked well, and is being taken up by industry in order to avoid a more hard-line regulatory approach. A number of Internet service providers, including some cable companies, are going for a default setting that does not include access to pornographic or gambling sites. A user who wants access to such sites actually has to opt in.

Convergence is here to stay, and the user does not distinguish between the delivery infrastructure and the content that is being delivered. There are definite benefits in being a converged regulator, but regulators need to consider how to react in the current challenging context.

Getty Images

Universal service funds

Addressing the missing link?

At this year's Global Symposium for Regulators (GSR-13) in Warsaw, Poland, one of the sessions focused on "Maximizing the potential of universal service funds through successful administration and management — Addressing the missing link". The session was moderated by Magdalena Gaj, President of Poland's National Regulatory Authority Office of Electronic Communications (UKE) and Chairman of GSR-13. Panellists were Vijayalakshmy Gupta, Member of India's Telecom Regulatory Authority; Monehela Posholi, Chief Executive Officer, Lesotho Communications Authority; Professor Fátima Barros, Chairman of the Board of Portugal's National Regulatory Authority for Communications (ICP — *Autoridade Nacional de Comunicações* — ANACOM); Eric Loeb, Vice-President, International External Affairs, AT&T; Gonzalo Ruiz

Díaz, Chairman of the Board, *Organismo Supervisor de Inversión privada en Telecomunicaciones* (OSIPTEL), Peru; and Lynne Dorward, Head of International Affairs at Telecommunications Management Group (TMG), and author of the ITU study on universal service funds and digital inclusion for all.

Ms Dorward presented the ITU study carried out on 69 funds, categorized by region, level of activity and the inclusion or not of broadband. Whether or not funds covered the digital inclusion of women and people with disabilities was also considered. Among the funds studied, 27 foresee broadband deployment, and an equal number envisage supporting telecentres. Approximately 26 have a very high level of activity. On the other hand, there are 18 funds that are almost totally inactive.

The rigid underlying regulatory framework often does not allow funds to adapt to the rapidly changing environment. There is often a large discrepancy between the funds collected and those actually used, and a lack of transparency, visibility and accountability in reporting is not unusual. In some cases, there are further problems of security, or even lack of electricity.

As Ms Dorward put it "In many cases, the funds are struggling because they don't have a clearly articulated set of policies and objectives, and that in turn also causes some challenges in terms of having appropriate management." She stressed that "There is a growing awareness that digital inclusion needs to be tackled much more than it is at present. And this means that all communities and targeted populations need to be included. There is a need for inclusion for persons with disabilities, women and girls, youth, children, and indigenous peoples — they all need to have access to affordable information and communication technologies to stimulate and promote social and economic development."

In this context, connectivity of the anchor institutions, such as schools, libraries, universities, hospitals, is very important. And even though there is a growing use of telecentres, there needs to be more focus in terms of what these telecentres provide. And that includes being equipped to support persons with disabilities; providing a safe and welcoming environment for women, youth, children, girls, the elderly;

providing digital literacy training; and respecting the cultural heritage of indigenous populations. So, these are some of the things that are not working well.

Critical success factors, in terms of the funds that are doing well, include a solid legal and regulatory framework, and autonomous and independent funds where all stakeholders are consulted. Other success factors are: a clear separation between universal service fund authorities and other entities, flexibility and neutrality in service provision, and transparency in project allocation. The blueprints recommend setting out a well-articulated policy, defining a clear legal and regulatory framework, creating a universal service fund that is an independent and separate entity, and ensuring a high level of transparency, visibility and accountability. It is essential to allocate funds to projects, and to adapt as new needs arise. Where funds are not being used, projects should be designed and plans drafted to make best use of the available resources. The six key principles for universal service funds are autonomy, flexibility, innovation, governance, inclusiveness and transparency.

In the discussion, speakers acknowledged that, in many countries, universal service funds exist and contributions are collected, but the money is not used. One option is to undertake pilot projects, for example to empower women and non-governmental organizations to develop local content, as has been done in India. Projects must be demand driven.

A bottom-up approach, including consultation of all stakeholders, is the most efficient way to make a universal service fund function correctly. Joint action between the regulator and the two existing operators was the basis for a success story in Lesotho, for example. The principle of transparency must be respected, including when development agencies make their contributions in kind.

The financing of universal service funds can be through public funds, contributions from operators, or hybrid solutions. In Portugal, it was decided that operators should contribute to a compensation fund, to avoid market distortion. The regulator has responsibility for managing the fund, and for ensuring transparency and accountability. Technological neutrality is compulsory. Consideration is now being given to including functional (not very high speed) Internet access.

What should funds be used for — infrastructure, services, local content or training? The answer depends on the particular situation in each country. It is evident, however, that funds must be used in a practical and operational way. One of the most efficient approaches to implementing projects is to coordinate the activities of different service providers, such as electricity and road network providers. Here, infrastructure sharing is the most practicable and economic solution.

A speaker from the floor observed that there are two main players in implementing universal service funds — operators

and regulators — and the budget should come from both sides. Infrastructure should be shared, and all operators should contribute to the fund. Operators that provide universal service should be refunded (from the universal service fund) for the extra costs they incur in reaching everyone. The regulator should be responsible for monitoring this mechanism. Plans differ from country to country, depending on the scope — be it for infrastructure, broadcasting or content.

In rural telecommunication projects, the most important aspect is sustainability. Projects should become self-sustaining within five years. It is also necessary to invest in the development of content to guarantee a minimum level of demand, so the health, education, commerce and services sectors, for example, should develop their

own content creation projects. These different sectors should coordinate their efforts, always bearing in mind the need to respect technology neutrality.

Summing up the discussion, Ms Gaj said that universal service is an important instrument to provide consumers — especially people in rural areas, and those with low-income or disabilities — with access to basic services at reasonable prices. It is vital to adopt an appropriate concept of universal service, define a proper scope and methods of financing, and ensure flexibility in the implementation of these methods, in accordance with national and local circumstances. When setting up rules for the universal service fund, certain factors should be considered. For instance, the rules should be clear and precise, they should be technology-neutral, flexible and

easy to adapt to the market; and the management of the fund should be transparent, autonomous and competitive.

Another issue is the proper scope of universal service and inclusion of new services and applications. Everyone agrees that society is changing fast and has various needs and rights which should be addressed. Today, people need access to information, which is often a public good, essential to all forms of economic activity and good governance. Internet access gives access to information and therefore in Ms Gaj's opinion, people today have the same right to access the Internet, as they have to water, electricity, and other facilities. These expectations should be taken into account by policy-makers and regulators.

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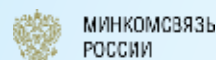
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Universal service Portugal's experience

Interview with Professor Fátima Barros

Chairman of the Board of Portugal's National Regulatory Authority for Communications (ICP — Autoridade Nacional de Comunicações — ANACOM)

Universal service is often described as a safety net for achieving social inclusion, with availability, affordability and accessibility as the watchwords. In this interview, Professor Fátima shares Portugal's experience.

Portugal has a mobile penetration rate of nearly 160 per cent. This is a remarkable achievement. Does it still make sense to impose a universal service obligation?

Professor Fátima Barros: It is an interesting question. Although the take-up of mobile networks is very high and the price of mobile services is declining, this does not mean that there is no need to set universal service obligations, because even competitive markets are not perfect. In fact, in competitive markets, some segments of the population may not have access to particular kinds of services. We must bear in mind that telecommunication companies find certain market segments unattractive from a commercial standpoint, and in the absence of universal service obligations, the communities concerned may be left without access to services.

Professor Fátima Barros

Fátima Barros is Chairman of the Board of Portugal's National Regulatory Authority for Communications (ICP — Autoridade Nacional de Comunicações — ANACOM) and a Professor of Economics. She holds a PhD in Economics from the Catholic University of Louvain, Belgium, and a BA in Economics from the Catholic University of Portugal. Before taking up her appointment as Chairman of ANACOM's Board in May 2012, she was Dean of the Católica-Lisbon School of Business and Economics, one of the flagship business schools in Portugal, where she has held a professorship since 1992, teaching in the graduate programme. She has published articles in leading international scientific journals on regulation, competition and contract theory.

Professor Barros held a wide range of academic responsibilities until her appointment in May 2012. In particular, she was a member of the Board of Directors of the European Foundation for Management Development, Belgium, from June 2008, and a member of the Board of Directors of the Association to Advance Collegiate Schools of Business, United States, from September 2011, having been a member of its Maintenance of Accreditation Committee since April 2009.

This applies in general to remote and rural areas and in particular to people with special needs or disabilities, for instance the blind and the deaf.

Because of the cost of reaching customers in remote areas, it may be unprofitable for companies to provide services to these areas (or less profitable than serving more densely populated areas). Similarly, people with disabilities may not have enough money to cover the cost of access to a range of services comparable to those enjoyed by other end users. Understandably, companies are unwilling to embark on activities for which they may not see a return on investment.

In all of these cases, the regulator must ensure that network access and basic and electronic communication services are provided to all at affordable prices. So we decided that universal service, based on technological neutrality, was still the best way of achieving this purpose.

Speed and quality vary widely among fixed and mobile networks, and it is up to the regulator to set minimum service requirements, to be provided at an affordable price on a non-discriminatory basis and regardless of the geographic location of users.

Universal service is an important factor in social development because it ensures that there is an open and competitive market and that the essential communication needs of all citizens are met. It also puts market competitors on a level playing field.

For these reasons, the Portuguese Government launched three tenders to select the company or companies that will provide universal service in electronic communications nationwide. The first tender concerns a connection to the public communication network at a fixed location and provision of a publicly available telephone service over that connection. The second involves provision of public payphones. The third calls for the provision of a comprehensive telephone directory and a directory enquiry service. In July, the Government announced the selected companies for the first and second tender. In the absence of bidders, there was no selection for the third tender.

Should broadband access be included in universal service?

FB The immediate answer would be yes, given the importance of the information society, the need to bridge the digital divide, and the advantages in terms of social cohesion. But a detailed cost-benefit analysis has led us to conclude that, for Portugal at present, the estimated 100 million euro investment that would be needed to ensure coverage of the entire population and subsidize prices might not be immediately taken up by market players during the current economic crisis, and might significantly distort competition.

The adoption of broadband is still in a growth phase in Portugal, and including it now as a universal service obligation might jeopardize technological neutrality. Broadband coverage in Portugal compares well with that in the European Union overall, as does availability.

Portugal has, for the time being, decided to keep functional access to the Internet (with a minimum speed of 56 kbit/s) as a universal service obligation. Given the public funding for the development of new-generation networks in rural areas and the obligations associated with the acquisition of rights to use frequencies in the 800 MHz band, broadband access will become more widespread in the next couple of years. That said, the possibility of including broadband in universal service obligations is being kept under constant review.

How should universal service be financed?

FB In Portugal, when discussing which model to adopt to fund universal service, we identified and focused on three main options: public funds; contributions from operators; or both public and private contributions (a hybrid model). After long debate — and some international benchmarking — we decided that operators should contribute to a compensation fund that will cover the net costs of universal service.

There were two main reasons for our choice of this model. One was that if you use public funds to cover the net costs of universal service, you are putting the burden on all tax payers. The other was that if operators cover these costs, you are putting the burden on the sector concerned, where the "user-pays" principle applies.

So operators will pay for the net costs of universal service, but may transfer part of these costs to users of communication services because, in general, operators decide what prices to charge consumers. We consider that this is the best way to avoid distorting the market in Portugal.

We now have a compensation fund that is independently managed by the national regulatory authority. Operators that provide public communication networks and/or publicly available electronic communication services in the national territory and that have a market share larger than 1 per cent must contribute to the compensation fund on the basis of their relevant turnover achieved in the calendar year to which the net costs relate. By setting a market-share threshold, we aim to avoid placing an excessive burden on very small operators.

The regulator is responsible for ensuring transparency and accountability, for auditing the net costs of universal service, and for charging operators the amount they should contribute to the compensation fund. The services included in universal service in Portugal are limited. We simply want to provide access to a minimum set of communication services of specified quality, at affordable prices, to any citizen in the country. Each year, the compensation fund collects just enough money to pay back operators for providing that universal service.

As Chairman of the Board, what have been the main challenges for you since taking up this function in May 2012?

FB Having been Dean of the Católica-Lisbon School of Business and Economics, the management function was not new for me. Therefore, my first big challenge was to get a closer insight into the world of electronic communications.

The challenging aspect of this particular sector lies in the fact that it moves extremely fast. New technologies and new services are constantly being introduced. Together with an evolving market structure, this results in a sector which is especially dynamic. Problems that you face one month are quickly overtaken by new ones that arise the next month.

From a different standpoint, it is also a challenge to deal with the implementation of the regulatory framework of the European Union. The European regulatory framework deals with complex issues and is not straightforward to implement. In addition, a number of measures and obligations have been introduced in recent revisions of the framework. As a result, past experience of implementing them is sparse.

Independent regulators and European institutions are engaged in a continuous learning process, with the aim of constructing a robust internal market — this is obviously a challenge. But generally, things are going well and the experience has been extremely rewarding.

As a decision-maker and ANACOM's most senior woman, what advice would you give to women who aspire to a similar career?

FB As a professor in a business school, I have met many young people throughout my career. Young girls are always keen to move ahead. But when they start a family, they often tend to focus only on the family. They easily get jobs with companies, but then slow down and lose the drive to advance.

For those women who really want to reach the top, my advice is: keep motivated to go on, and believe in your own capabilities.

I remember that one of my students wrote to me and said: "You are a role model for us, female students". My feeling is that it is motivating for young female students to see more and more women taking on key decision-making positions. It makes them believe that they can get there too.

So, I think that we need more women in leadership positions, including on boards. But this should not be achieved by introducing quotas. Rather, more men need to recognize that having women on the board is a very positive thing. Finally, I believe that women do not need to act as men to get into leadership positions. This would be wrong because of our diverse natures. Women do not need to mimic men's behaviour!

Net neutrality

Interview with Dr Leonidas Kanellos

The 2013 Chairman of the Body of European Regulators for Electronic Communications (BEREC), and President of the Hellenic Telecommunications and Post Commission (EETT), Greece

Net neutrality has been a hot topic for regulators for some time now. In the following article, ITU News seeks the views of the Body of European Regulators for Electronic Communications (BEREC) on this important subject. We hope in due course to bring you the opinions of other regulators from around the world on how they are treating net neutrality.

Why is net neutrality so important to European regulators?

Dr Leonidas Kanellos: The Internet has contributed enormously to growth and innovation in world economies, and has become a crucial part of the everyday life of most citizens. Much of this success is down to the openness of the Internet, which operates on the basis of an application-agnostic, best-efforts paradigm. This approach provides low barriers to entry and fertile ground for innovation, in particular in the development of new content and applications.

Dr Leonidas Kanellos

Dr Kanellos is an attorney-at-law and a member of the Athens Bar Association, with long professional experience in the application of the electronic communications and competition laws of the European Union (EU). He graduated from the Faculty of Law of the National and Kapodistrian University of Athens (1984), and holds a PhD in Law (1990) and a DEA in "Information Technology Law and Legal Information Technology" (1985) from the University of Montpellier, France.

Dr Kanellos served as a member of the Legal Advisory Board of the European Commission Directorate General for Information Society from 1990 to 2001. Between 1989 and 2009, he led several projects and international studies aimed at introducing EU law into Greek legislation in such areas as competition analysis of networks and services, convergence of multimedia technologies, electronic commerce, electronic signatures, intellectual property in software and databases, consumer and data protection, legal protection of technical standards, regulatory compliance with safety regulations, and fibre-to-the-home. He has served as a legal expert in a number of international and national committees, lectured at the Aegean University and the University of Piraeus, published many articles and contributed to several books. Dr Kanellos co-authored the Founding Act of the Hellenic Telecommunications and Post Commission (1992).

As regulators, it is our role to safeguard competition (including in the delivery of content), to promote innovation, and to foster the freedom of end users to access and distribute content and run applications of their choice online. To achieve these objectives, we need to monitor the market and be ready to intervene if necessary.

One area to watch is traffic management. Internet service providers have developed the technical means to actively manage data traffic over their networks. Of course, this practice is not intrinsically damaging to competition, innovation or consumer welfare. In fact, it should be welcomed when it aims at guaranteeing network integrity or improving the efficiency of resource allocation.

Our main concerns relate to traffic management that restricts particular applications (for example, blocking access to VoIP on mobile networks or throttling peer-to-peer traffic) and billing policies that differentiate between applications. If Internet service providers commonly prioritize specific users or applications or specialized services, then the "best efforts" Internet could be undermined and services to the general user could fall below an acceptable level. This might well call for a regulatory response.

How can regulators promote net neutrality?

LK European regulators have the power, under the European Regulatory Framework, to promote effective competition by imposing remedies on operators with significant market power. Such remedies may include requirements regarding price, access and non-discrimination. Regulators can thereby create commercial incentives for operators to provide access to high-quality products.

Effective competition also relies on the ability of customers to switch suppliers, which implies low barriers to switching in terms of cost, time and ease. The availability of unrestricted offers also spurs competition. BEREC is looking at consumer behaviour, and investigating how traffic management practices affect customers' switching decisions.

Transparency of terms and conditions is also necessary for competition to operate properly and hence for the promotion of net neutrality. End users must have access to information about offers available on the market, so that they can identify the quality parameters (and any restrictions) and choose the offer most suited to their needs. BEREC continues to exchange experience with other regulators on how to ensure that the information provided on these services is understandable and comparable. The possibility of developing common frames of reference for describing Internet access services (including terminology and quality parameters) is also being considered.

The above-mentioned regulatory tools and practices may not always be sufficient to address net neutrality challenges. BEREC therefore recommends that regulators continuously monitor the quality of Internet offers and the evolution of the market, in order to detect service degradation, look for evidence of the availability of affordable unrestricted Internet access offers, and follow trends in specialized services and traffic management practices.

Depending on the conclusions of such monitoring, regulators can impose minimum levels for quality of services, or prohibit blocking and throttling. BEREC nevertheless believes that such powers should be used with caution, and typically only where other regulatory tools are unable to make a sufficient impact.

AFP

What is your assessment of the current situation regarding net neutrality in Europe?

LK In May 2012, BEREC published its findings on traffic management and other practices resulting in restrictions to the open Internet in Europe. According to the report on these findings, a majority of Internet service providers offer Internet access service with no application-specific restrictions. But certain practices, such as blocking or throttling of peer-to-peer traffic or VoIP, may be detrimental to end users. These practices occur more often in mobile networks than in the fixed network sector, but there are significant differences between national markets.

Concerns about net neutrality are legitimate, because rapidly evolving practices make it credible — though not certain — that problems will arise more frequently in the future. National regulatory authorities should therefore continue to closely monitor the evolution of the market, including by measuring the quality of the IAS available, and be ready to act swiftly if necessary.

Proponents of net neutrality are concerned by the practices of other players in the Internet ecosystem, and they are calling for extended national or European legislation to guarantee continued equality of treatment along the Internet value chain. Some of them have expressed concern about the possibility that over-the-top (OTT) providers and terminal manufacturers may restrict access to content, as these players increasingly gain momentum and the power to steer consumer choices. Search engines and operating systems for mobile devices are also often depicted as playing a key role in the link between users and content.

How do you see the way forward?

LK BEREC believes that existing regulatory tools enable regulators to address net neutrality concerns for the time being. At the same time, it is important to bear in mind that market structures and local consumer behaviour, as well as national legal systems, vary across Europe. Thus, while European

regulators will continue to pursue the same objectives and apply the same principles, national regulators will need to adopt specific triggers and thresholds for regulatory intervention in their own markets in order to most effectively address national circumstances.

Going forward, Europe's regulators will continue to monitor the quality of Internet access service offers (including traffic management practices and the availability of unrestricted offers), as well as market trends (focusing particularly on understanding the end-user perspectives and demand-side forces) that may affect net neutrality. We are also looking at the various available platforms and approaches that can be used for measuring the quality of Internet access services. We are seeking to exchange experience and to build know-how among regulators. BEREC will, of course, continue to provide its expert opinions to the European institutions in the context of policy and law making in this area.

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■ *Poland goes fully digital with television broadcasting*

Interview with Magdalena Gaj

President of Poland's National Regulatory Authority Office of Electronic Communications

Poland completed its analogue switch-off on 23 July 2013. ITU News caught up with Magdalena Gaj, President of Poland's National Regulatory Authority Office of Electronic Communications to gain insight into the country's successful transition to digital television broadcasting.

Ms Gaj, in 2009, as Deputy Minister of Infrastructure you were appointed to head the "Interministerial Group for Transition from Analogue to Digital Television and Digital Radio" and entrusted with digitizing Poland. Tell us more about this group and the implementation plan you launched to set the country on the path from analogue to digital television.

Magdalena Gaj The transition from analogue to digital television presents a complex problem. As specialists, we tend in the first place to think about the technical aspects. But we also have to deal with the programming aspects (the content that will be available for viewers) and the social aspects (how to reach citizens with information and help them cope with this complicated process).

This is the reason why in Poland the Prime Minister decided to create an interministerial group, composed of representatives of different ministries — ranging from the Ministry of Culture and the Ministry of Labour and Social Policy, to the Ministry of Infrastructure and the Ministry of Finance. In this multi-sectoral group, we were able to quickly and deftly handle problems that arose in the drawing up of the implementation plan for digital television, and to allay doubts and uncertainties.

The plan, eventually adopted by the Council of Ministers as a government document, defined the purpose of multiplexes (all-Poland coverage), set the switch-off date, selected the technology (DVB-T) and standard (MPG-4) to be used, and indicated the steps to be taken and the need for legislation.

You then drafted the digitization act. What did this act cover in terms of regulation, and why was it so important?

MG In Poland, we decided to draft an act primarily because of the huge resistance from broadcasters, who still had valid analogue concessions. Without the act, which imposed certain responsibilities and set a date for analogue television switch-off, I believe that the transition process would still be going on.

The act provided that the existing commercial broadcasters (there were four) would get one multiplex for their joint use, while the public broadcaster would get one separate multiplex exclusively for its own use.

The act also made it obligatory to carry out an information campaign. The minister tasked with communications was ultimately responsible for the campaign, but broadcasters were also legally bound to broadcast a certain number of information messages at fixed time slots throughout the day, during the period from the coming into force of the act until the switch-off date.

What did the analogue terrestrial television platform offer in terms of services, and who were the public and commercial broadcasters?

MG The analogue terrestrial television platform offered only television channels. Public service broadcaster TVP offered two nationwide programmes (TVP1 and TVP2 — covering 97.6 per cent of the population) and one regional programme (TVP Info — covering 72.1 per cent of the population). We also had four commercial broadcasters, namely TVN (covering 43.1 per cent of the population), POLSAT (covering 81.1 per cent of the population), PULS (covering 24.8 per cent of the population) and TV4 (covering 25.1 per cent of the population).

How did broadcasters react to switching from analogue to digital television?

MG Initially, broadcasters did everything they could to obstruct or slow down the process. Two of the broadcasters already had — and still have — their own satellite platforms. At the outset (in 2008), market regulators held talks with Polish broadcasters to try to persuade them to voluntarily engage in the transition process. But broadcasters resorted to different stratagems to avoid the regulators.

I took part in those talks, and that is why, when I became the minister responsible for conducting the transition process in Poland, I was convinced that only a legal act and regulatory obligations would offer a chance to efficiently and effectively manage this process. Once broadcasters saw the determination of the regulator and recognized the inevitability of the process, they began to cooperate.
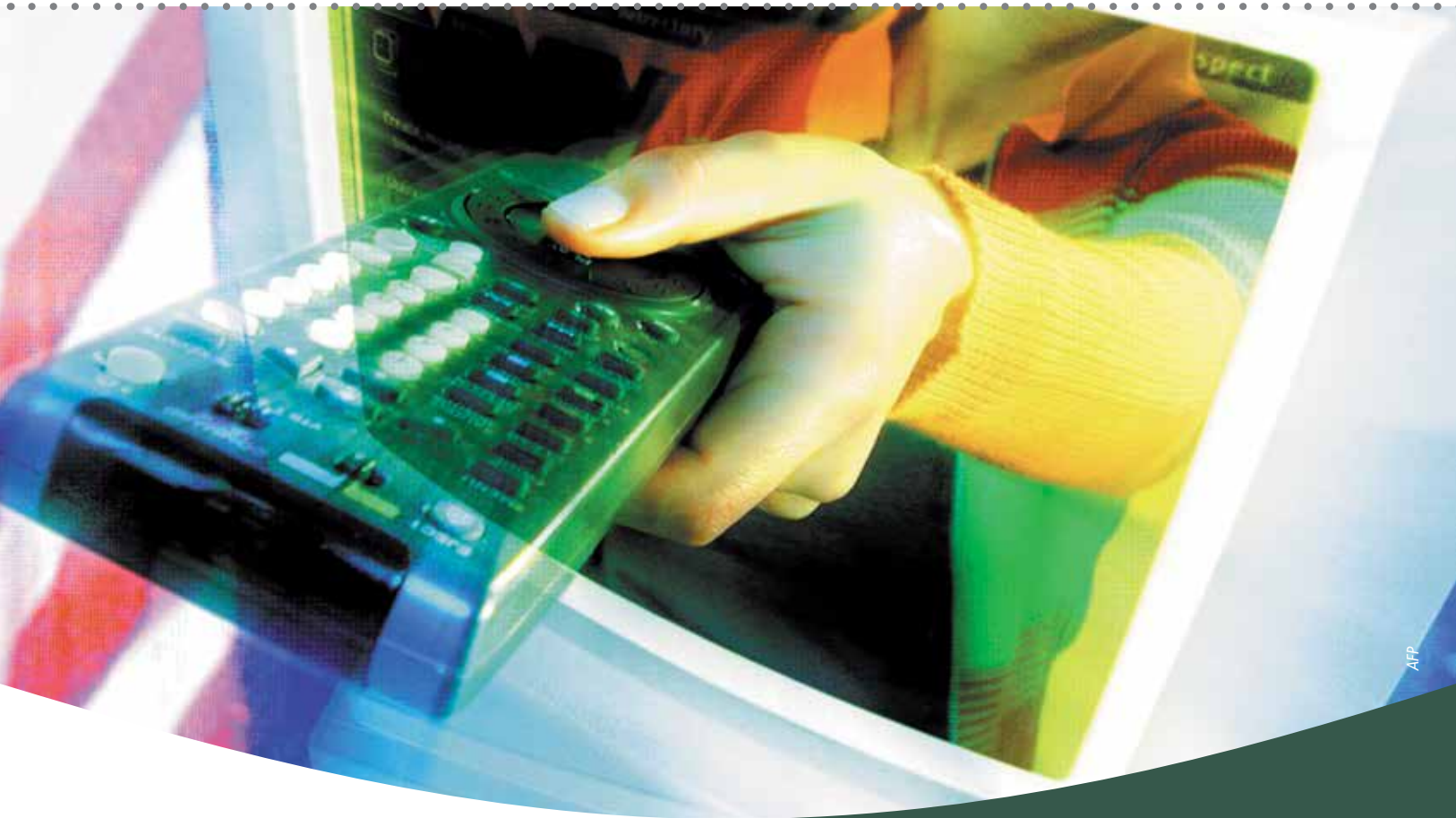
Why was DVB-T selected as the standard and how was this choice received by broadcasters, especially those who had their own channels via satellite?

MG Broadcasters, especially those with their own digital satellite platforms, were — to put it mildly — not overjoyed with the situation, because they saw the potential implementation of terrestrial digital television as a threat. Before the implementation of DVB-T these broadcasters had a monopoly on good quality, high-definition television capable of providing additional services (for example, more soundtracks, services for the hearing-impaired, as well as hybrid broadcast broadband television services).

Those added services and, of course, the possibility of providing reception, were reasons for the migration from analogue to digital. We are already providing more than 98 per cent of Poland's population with access to 22 digital channels and, what is more important, these channels are free of charge. In comparison, before the transition,

between three and seven analogue channels were available and were of a lower quality. The important measures taken previously within ITU and the European Union were surely instrumental in improving the service offer.

One-third of Polish citizens used to receive television only through a terrestrial analogue signal. As a minimum, digital television had to guarantee these viewers the possibility of watching the same programmes.

The choice of DVB-T and MPEG-4 as the obligatory standard for terrestrial digital television in Poland was made in 2009, when the implementation of the DVB-T2 standard started. At that time, we had planned to use MPEG-2 as the image compression standard, but in order to get the greatest possible capacity from terrestrial multiplexes, for example by enabling the broadcasting of HD channels, MPEG-4 was finally selected. The main argument for choosing this standard was the wide range of devices available and the relatively accessible purchase price. Another reason was not to burden viewers with high costs connected to the replacement of receivers.

How did you win the support of private sector entities, and what did they contribute to the transition, especially in the awareness campaign that you ran?

MG Frankly speaking, I guess I persuaded them through my determination and stubbornness. They saw that I would carry out this process with or without them, so they made the right choice, realizing that it was better to cooperate and exert influence in some matters, rather than stand by inactively knowing that the transition would happen anyway.

How did they engage? I signed a public-private partnership agreement with them through which they co-financed the production of several news flashes and infomercials that were broadcast regularly for almost two years. The private sector was legally obliged to allocate air time for broadcasting the awareness campaign. In addition, one Chamber of Commerce helped us a lot in preparing content for leaflets and flyers to inform users how to connect a decoder. This Chamber of Commerce also drafted a lesson on digitization, which was sent to all schools to help teachers in giving compulsory lessons on this topic to every class.

In 2012 you were appointed President of the Office of Electronic Communications (UKE) and were made responsible for implementing the switch-off process. How was this carried out?

MG The act on digitization was adopted in 2011, and the process of switching off analogue television was carried out in seven stages, from 7 November 2012 to 23 July 2013. In the first two stages, switch-off took place in sparsely inhabited areas. The experience that we gained from this exercise was of benefit in the subsequent stages, and successive switch-off and transition to digital broadcasting were managed smoothly.

Before each stage, in the areas that were to be included in analogue television switch-off, the availability of digital

television signals was measured and DVB-T signal intensity was analysed simultaneously. On that basis, we were able to identify towns where problems with reception of digital television were likely to occur, and we used the mass media to inform people what actions they should take.

How did UKE prepare viewers throughout the country for the analogue switch-off and transition to digital television?

MG Apart from the nationwide media campaign, which I launched while in government and which is still being managed and developed by the government, we prepared thousands of information leaflets. These leaflets explained the process and included simple images with instructions on how to plug in a decoder to an old type of television set or what to do with an aerial.

My office has 16 branches — one in each of the 16 regions of Poland. Thanks to this decentralized presence, we were able to directly reach a large number of citizens and, what is more, citizens could easily reach us. We also took an active part in the Digital Towns initiative organized by the public broadcaster. This involved outdoor parties in the different cities, towns and villages included in the particular switch-off stage concerned. We were present with our mobile measuring stations and cars, and were always ready to visit sites to check the signal quality.

We created Digital Brigades and invited high-school students specializing in communications to lend us a hand. The task of the Digital Brigades was to help elderly people who had technical problems connecting devices. The young technicians engaged enthusiastically in this work and exhibited an impressive level of commitment. It was very pleasing to see the switch-off and transition process being used to inculcate worthy social behaviour in young people and give them an opportunity to help those in need. The Digital Brigades solved a lot of the difficulties faced by

people aged over 50 years. The country's 25 technical schools also engaged in activities initiated by UKE to help people for whom the transition process might cause problems.

Polish Post offered the possibility of buying DVB-T decoders from its offices throughout the country. This was particularly important in small towns and villages. It was estimated that 3 million people were likely to buy this type of device.

Terrestrial digital television signals reach places where television was previously unavailable, and overall coverage has increased from 98.7 per cent to 99.5 per cent of the population.

What did viewers themselves need to do in order to receive digital television, and how did you avoid digital exclusion?

MG Viewers needed either a new television set complying with the MPEG-4 standard or an old set for which it was possible to buy a decoder. There was no financial support programme to help citizens buy decoders. Obviously, we monitored the situation in order to make sure that nobody was deprived of television. If that problem had arisen we would have launched an appropriate programme.

Our approach was to let the market forces act, with the proviso that if the market did not achieve the desired result, then we would react.

With hindsight, we conclude that our approach has been better for society than subsidizing the purchase of DVB-T sets. If the government had announced subsidies for the purchase of devices, prices would have risen or at best remained stable. In fact, when digitization started in Poland, free market competition caused a decline in prices and thereby increased accessibility for all.

In Poland, we focused on guaranteeing the technical availability of the signal. State funding enabled the public television broadcaster to construct 127 subsidiary stations

UKE/Poland

(gap-filler stations), thanks to which the terrestrial digital television signal now reaches more than 99 per cent of Poland's population. To check the reach of the digital signal, my employees made 47 000 measurements in 8500 towns as part of mobile measuring teams from UKE branch offices. In the 10 000 hours that it took to make those measurements, the mobile measuring stations covered a distance of 200 000 kilometres.

It is now up to the individual citizen to decide whether or not to take advantage of the available reception.

Was the transition problem-free or were there disruptions in service provision? And what lessons can other countries learn from Poland's experience?

MG I can say today that the switch-off in Poland was smooth and problem-free. There were some minor glitches on the actual day of switch-off or in the following few days but they concerned, for example, detuning the channels in the television set or redirecting the aerial towards the new transmitter. Nothing serious has happened, and there has been no interruption in providing services.

What would be my advice? In my opinion, determination and strength of character are required to drive this complex process. In each country, the process requires a leader and the cooperation of all stakeholders — government, regulators of the market, public and commercial broadcasters, as well as technical operators. In Poland, local administrations and local governments played an important role. Many organizations and volunteers actively joined in the process. Without the cooperation of all the players in the ecosystem, successful digitization — in Poland or in any other country — would in my opinion be impossible. All the activities need to be coordinated and require a common plan — so again what is necessary is determination and strength of character, as well as the skills to manage such a complex organizational and technical process.

How will the digital switch-over benefit viewers and Polish society as a whole?

MG Again, thanks to digitization, Poles have gained access to a wide range of channels as well as to a higher quality television signal and additional services.

Of the seven analogue channels previously available, only three reached as much as 60 per cent of the population. After switch-off, viewers gained 22 nationwide channels of much better quality, free of charge, reaching almost the entire population.

The transition to digital transmission enables the introduction of additional services, such as electronic programme guides; ability to record, stop and rewind programmes; video-on-demand; parental control; high-resolution broadcast in different formats (4:3 and 16:9); parallel emission of several soundtracks with choice of language version or audio mode; subtitles, audio description and different language version subtitles; the possibility to transmit alarm announcements in emergency situations, for example during floods or hurricanes; and hybrid broadcast broadband television services.

In the future, the Internet, e-government, interactive educational channels, banking services and games, among other services, may also be offered.

How will the digital dividend spectrum be used?

MG When introducing the implementation plan for digitization, we decided that the digital dividend would be used for broadband Internet access. And this is actually happening. I have just finished work on the auction documents, and by the end of this year I intend to carry out the auction for the frequencies freed up thanks to the switch-over to digital.

In my view, broadband Internet is the future. It will contribute to the development of our countries and our citizens. The radio-frequency spectrum is a powerful and important tool that we as decision-makers hold in our hands. We should manage it efficiently.

Radio-frequency spectrum

What will be left for the next generation?

Fabio Leite, Deputy to the Director, ITU Radiocommunication Bureau

Advances in radiocommunication and spectrum management have led to tipping points in technology, for example the

invention of the semiconductor and micro-processor, the shift to a digital, converged, personalized, broadband world, and now the advent of spectrum cognition in radio devices.

At the same time, regulatory activities are evolving from a centrally planned, regulated and market-driven approach to what may become an open radio environment.

During this period, we have seen radio moving from utility-based to technology-based devices, and wireless evolving from an exclusive technology to become a core function embedded in every device and available in almost every home.

For these trends to progress for the benefit of users, we need to take wise and timely decisions on spectrum policy and management. These decisions will be taken in the common interests of all, not just to offer advantages to a few countries. That is where ITU will continue to play a vital role for the benefit of humanity as a whole.

A memorandum by the President of the United States, published in June 2013, recognizes that expanding the availability of spectrum for innovative and flexible commercial uses, including for broadband services, will further promote economic development by providing citizens and businesses with greater speed and availability of coverage, encourage further development of cutting-edge wireless technologies, applications and services, and help reduce usage charges for households and businesses. Similarly, the Digital Agenda for Europe acknowledges that radio spectrum is an essential natural resource for wireless connections and innovation.

All this puts ITU in the spotlight, and particularly its Radiocommunication Bureau, which must fulfil the task of ensuring "the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services," according to the ITU Constitution.

Regulations that respond to needs

Appropriate frameworks for regulating spectrum on the national, regional and global levels are essential to make spectrum available on a timely basis and its use as efficient as possible.

The WRC process is the mechanism by which ITU Member States update the Radio Regulations, the international treaty governing frequency spectrum and satellite orbit use. These global conferences are convened every three to four years and may be attended by as many as 3000 delegates from the 193 ITU Member States, who meet over a period of four weeks to discuss more than 2000 legally and technically complex proposals to update the treaty.

In preparation for these global conferences, government and industry experts adopt reports that provide the technical bases for WRC debates. These reports comprise mainly the results of studies on the possibility of sharing spectrum among the various radio services concerned. For more than a century, this process has proven to be responsive to the accelerating growth in radio spectrum needs, emanating from the increasing demand for innovative wireless services and applications.

Some examples show how the ITU process of spectrum allocation has responded to government and industry needs, fostering innovation. World radiocommunication conferences (WRCs) have taken many forward-looking decisions, for instance in 1992 on global mobile personal communication systems better known as GMPCS (such as Iridium) and IMT-2000 (3G) spectrum allocations, in 2000 on global navigation satellite systems (such as Galileo), in 2003 on Wi-Fi (for example, 802.11a in the 5 GHz band), in 2007 on IMT (concerning 3G additional spectrum and 4G), and in 2012 on the second digital dividend (notably 4G in the 700 MHz band).

Today, the Radio Regulations — a book of some 2000 pages — govern the use of more than 40 radio services and cover the whole of the usable radio spectrum, from the extremely low frequencies used for lightening detection to the extremely high ones used for scientific passive observations. These complex regulations have evolved from the International Radiotelegraph Convention of 1906, a 20-page document regulating only the international maritime service.

Harmony or discord — take your pick

One of ITU's major objectives in considering the allocation of spectrum to different radio services is to seek harmonized solutions on a global or regional basis. Spectrum harmonization reduces the cost of mobile hardware (for example, leading to cheaper smartphones) and the cost of infrastructure, enables global roaming, decreases the complexity of radio design, reduces interference with adjacent

services, and helps in managing cross-border interference.

Despite these advantages, mobile spectrum allocations are not harmonized throughout the world as a consequence of uncoordinated national regulatory decisions on the use of the new 3G/4G bands allocated by WRC-07 and the legacy allocations of 2G spectrum bands. Examples of the lack of spectrum harmonization are the North America frequency plan for 700 MHz, and the use of CDMA in 850 MHz and GSM in 900 MHz.

ITU, in coordination with regional groups, is working towards promoting harmonization of the mobile broadband spectrum, particularly in the frequency bands freed up by the transition from analogue to digital terrestrial broadcasting (the digital dividend).

We have come a long way since the early days of telegraphy, when telegraph lines did not cross national borders and when each country used a different system, so messages had to be transcribed, translated and handed over at frontiers, to be retransmitted over the telegraph network of the neighbouring country. But there is still a way to go.

Dynamic shared access to spectrum

Some spectrum management techniques depart from the traditional command-and-control mechanisms used for most of the frequency bands, and have also driven innovation.

Wireless access networks such as Wi-Fi, for example, have developed within unlicensed spectrum, shared on a commons approach on the basis of "best effort". A plethora of wireless technologies to provide short-distance wireless access to devices, including personal appliances, have been or are being developed within the spectrum bands identified for unlicensed use. These include technologies that are expected to create the next wave of the wireless revolution — known as the Internet of things, because they concern

mainly machine-to-machine connections or simply large numbers of objects to be connected.

Today, connected humans are already in the minority of Internet "users". According to an estimate made in 2010 by Ericsson, there will be more than 50 billion connected devices by 2020, outnumbering connected people by a ratio of perhaps ten to one, and transforming our concept of the Internet forever.

Creative ideas are being studied or implemented to provide effective regulatory responses to deal with the growing and urgent spectrum requirements of services and applications. One such idea is the concept of authorized shared access, whereby dynamic use of the spectrum is made whenever and wherever frequencies are unused by incumbents. This sharing takes place on a non-interference basis, subject to individual authorization (in other words a licence), in bands allocated to the mobile service (and identified for IMT) by ITU. The techniques deployed to enable this sharing of bands are within the general concept of cognitive radio — geolocation databases complemented, if required, by sensing.

A derivative of these ideas concerns the use of idle spectrum in the bands assigned to video broadcasting, known as television white spaces. In this case, the opportunistic use is normally on a licence-exempt basis. This approach is currently getting the attention of the most important players in the Internet industry. In June 2013, a group of 23 organizations from around the world formed the Dynamic Spectrum Alliance to promote improved spectrum management and help develop new wireless technologies.

From spectrum identification to commercial deployment

One enlightening example of the relationship between spectrum and innovation is related to 3G mobile communications — known to ITU and the industry as IMT-2000. In 1986, ITU set up a group of experts to discuss the concept and requirements for a future land mobile telecommunication system based on personal cellular phones to be used on a worldwide basis. Mobile phones weighed 1.3 kg and were sold at a cost of USD 4000 each. By 1992, ITU visionaries had been able to define the system design and identify the needed spectrum. At that time, the first GSM networks — 2G — were being rolled out in Europe, thanks to the establishment 13 years earlier, in 1979, of spectrum for GSM.

The timespan from spectrum definition to commercial deployment was reduced to eight years for 3G, if the 3G system launched in Japan in October 2000 is considered to be the first. This delay was reduced to three or four years for the 4G systems being deployed in the digital dividend spectrum and for future generation mobile systems that will be deployed in spectrum that is in the course of being earmarked today.

The identification of additional spectrum with particular physical properties has given rise to the advent of, on the one hand, broader coverage with fewer base stations (VHF/UHF of the digital dividend), and on the other hand, higher capacity wireless systems of the IMT family, which are becoming an effective way to provide the greater part of the world's population with broadband access to the Internet.

More than 150 years ago, when the electric telegraph was invented, an Australian newspaper commented that "anything more perfect than this is scarcely conceivable, and we really begin to wonder what will be left for the next generation, upon which to expend the restless energies of the human mind."

Incredible progress has been made since then, and more is certain to come. The directions defined by spectrum management decisions will pave the way and dictate the pace of wireless innovation.

The Internet of Things

Machines, businesses, people, everything

By Alain Louchez, Georgia Tech Research Institute, Atlanta, Georgia, United States

Alain Louchez is leading a global initiative at the Georgia Institute of Technology focusing on the development and application of Internet-of-Things technologies.

The intriguing Internet of Things is the centre of a conglomeration of bustling activities, from education, research and standardization to economic planning. While there is no generally accepted definition of "Internet of Things", it can be viewed as the ability for things and people to remotely interact through the Internet anywhere, anytime, thanks to the timely convergence of many technologies.

Machines, everyday objects and virtual elements (such as digital pictures) now have the possibility to be identified in the same way as individuals on the Internet of people. As a result, things can be integrated into a vast web of interrelations where they can communicate with each other or with people. Essentially, in the world of the Internet of Things, things are now on par with people.

In most cases, thing-to-thing communications will be found in the business-to-business (B2B) arena and thing-to-person communications in the business-to-consumer (B2C) arena.

ITU defines the Internet of Things as a "global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things, based on existing and evolving interoperable information and communication technologies." ITU's foundational definition, published on 4 July 2012, offers useful insight and a sound springboard for further analysis and research into the Internet of Things. Importantly, ITU points out that the Internet of Things is a "vision", not a single technology, and that it has "technological and societal implications".

Making the business case

There are many more things than people on Earth — the tally of things that could be part of the Internet of Things varies enormously according to experts. No matter what the exact number is, it is big! For example, according to estimates made by Cisco's Internet Business Solutions Group, some 25 billion devices will be connected to the Internet by 2015, and 50 billion by 2020. These things include mobile devices, parking meters, thermostats, cardiac monitors, tyres, roads, cars, supermarket shelves, and even cattle.

An earlier study released by Ericsson also predicts that 50 billion devices will be connected to the Internet by 2020, dwarfing the scale and scope of the Internet and mobile worlds as we know them. A study from Cisco on the "Internet of Everything" makes the business case for a

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USD 14.4 trillion market, by 2022, for networking basically everything.

Some of these statistics were shared during a session on "The need for more IP addresses" at the ITU Global Symposium for Regulators, held in Warsaw, Poland in July 2013. IPv6 deployment was seen as crucial for the Internet of Things to become a reality.

The Internet-of-Things galaxy

In the Internet of Things, there are "stars", which have generated a lot of interest and research over the last thirty years, confirming its growing importance.

The Internet-of-Things galaxy encompasses ubiquitous computing, radio-frequency identification (RFID), cyber-physical systems, wireless sensor networks, and machine-to-machine (M2M) communications. Other clusters — not covered in this article — such as those centred on pervasive computing, autonomic computing, human-computer interaction, ambient intelligence, and, more generally, on smart objects, systems and technologies are also intrinsically connected to the Internet of Things.

Where did it all start?

Ubiquitous computing

The late Mark Weiser and his associates at the Xerox Palo Alto Research Center are credited for their seminal contributions in ubiquitous computing (which Weiser conceived in 1988). Later, he and John Seely Brown advanced the concept of calm technology, which they hoped would "come to play a central role in a more humanly empowered twenty-first century". Today's aspirations of the Internet of Things still echo this thinking.

Weiser, in his famous article in Scientific American in 1991, "The Computer for the 21st Century", described what could now be seen as the basic requirements of an Internet of Things architecture (device, network and application domains). "The technology required for ubiquitous computing comes in three parts: low-power computers that include equally convenient displays, a network that ties them all together and software systems implementing ubiquitous applications".

Countless laboratories and research groups around the world are focusing on

ubiquitous computing. Entire countries have developed programmes based on this concept, for example, u-Japan (following e-Japan) and u-Korea.

Radio-frequency identification

Around 1998, Sanjay Sarma and David Brock at the Massachusetts Institute of Technology (MIT) came up with the idea of putting low-cost RFID tags on everything and linking them to the Internet. While obvious now, at the time, the decision to incorporate the Internet into the architecture was an important leap of faith.

In 1999, the Uniform Code Council, the European Article Number International (EAN International), Procter & Gamble and Gillette agreed to establish the Auto-ID Center at MIT, where the research team included (in addition to Sarma and Brock) Daniel Engels, Kai-Yeung Siu and Kevin Ashton, who coined the expression "Internet of Things". One of the goals of the Auto-ID Center was to develop automatic identification technology, the Electronic Product Code (EPC), to replace the Universal Product Code (UPC) bar code.

At the end of October 2003, the Auto-ID Center was replaced by the Auto-ID Labs, and EPCglobal. Auto-ID Labs is a network of seven universities located on four different continents. And EPCglobal was a joint venture between GS1 (formerly EAN International) and GS1 US (formerly the Uniform Code Council). EPCglobal develops standards and manages the EPC network.

While the Internet of Things includes a broad range of interfaces beyond RFID, many people still consider that it is inherently RFID-based and oriented towards the retail and supply chain. In November 2012, Sarma announced the launch of the "Cloud of Things" initiative at MIT, expanding the RFID-based research to integrate cloud computing and big data.

Cyber-physical systems

The concepts of cyber-physical systems and the Internet of Things are undeniably intertwined. Around 2006, Helen Gill of the United States National Science Foundation (NSF) suggested that "Cyber-physical systems are physical, biological, and engineered systems whose operations are integrated, monitored, and/or controlled by a computational core. Components are networked at every scale". Her vision was that "Computing is 'deeply embedded' into every physical component, possibly even into materials. The computational core is an embedded system, usually demands real-time response, and is most often distributed."

This new concept, fully embraced by a host of United States federal agencies including the National Institute of Standards and Technology (NIST), has quickly led to related research projects and educational initiatives. For example, the first NSF-sponsored Summer School on Cyber-Physical Systems was held at the Georgia Institute of Technology, Atlanta, Georgia, in June 2009.

Like ubiquitous computing, which was used as a technological guide in Japan and the Republic of Korea, cyber-physical systems are referred to in Germany to explain the country's move to smart production. According to economic development agency Germany Trade & Invest (GTAI), smart industry or "industry 4.0" is the technological evolution from embedded systems to cyber-physical systems. GTAI says that industry 4.0 represents what will be the fourth industrial revolution on the way to an Internet of Things, data and services.

Wireless sensor networks

Wireless sensor networks are a fundamental constituent of the Internet of Things. This domain has strong scientific, technological and industry backing, and the link with the Internet of Things is immediate.

As a case in point, the University of California at Berkeley houses an Open Source Wireless Sensor Networks (OpenWSN) project founded in 2010, with the aim of implementing the Internet of Things. OpenWSN serves as a repository for open-source implementations of protocol stacks based on Internet of things standards, using a variety of software and hardware platforms.

The extension of sensor networks to the very small and molecular levels is being investigated around the world. This type of research — such as the groundbreaking work of Kris Pister at the University of California at Berkeley on smart dust (a

collection of countless tiny micro-electro-mechanical systems) and Ian Akyildiz at the Georgia Institute of Technology on the Internet of nano-things — provides a window into the future shape of the Internet of Things.

Machine-to-machine communications

M2M is probably the earliest manifestation of the Internet of Things.

An international partnership of major standards-developing organizations — known as oneM2M — defines an M2M solution as a "combination of devices, software and services that operate with little or no human interaction".

Pioneering data transmission technologies, such as basic telemetry and industrial control systems can legitimately

be seen as M2M precursors. Telemetry services provided by Mobitex, a low-speed, short-message, wireless packet-switched data network, developed in the beginning of the 1980s by *Televerket* of Sweden (the predecessor of Telia Sonera) and later on in partnership with Ericsson, is one of the first technologies to address directly the needs of the nascent M2M market.

Over the years, M2M has evolved towards advanced remote monitoring and control. Recently, M2M has begun to offer enabling platforms, integrating mobile and/or fixed, wired and/or wireless networking architectures (such as wireless personal area networks), and cellular and satellite (including global positioning system) services. By its very nature, M2M deals with thing-to-thing interaction and is grounded in the business-to-business

market. It is a critical enabler of the Internet of Things.

An idea whose time has come?

The global interest for the Internet of Things has grown exponentially in the last five years. Scholarly journals exclusively focusing on this topic have been launched, highly visible world forums, congresses and summits are organized to address it while media around the world regularly discuss implications of its arrival and the ensuing societal transformation.

An example of the importance of the Internet of Things as both a transformative force and growth engine is its incorporation into China's five-year plan (2011–2015) as a national strategic priority. The plan

recognizes the Internet of Things as a major direction of China's new generation of information technology innovation and development. Many Chinese universities now offer a bachelor's degree in the field of Internet of Things engineering. Building smart cities is another area where China would rely on Internet of Things applications to make infrastructure and services more interconnected and efficient. As of January 2013, more than 40 Chinese municipalities had expressed their plans to build smart cities in this way.

Elsewhere, the European Union provides another example. In June 2010, the European Parliament adopted a resolution on the Internet of Things with many associated points and action items, including "the view that the development of the Internet of Things and related applications will have a major impact on the daily lives of Europeans and their habits in the years ahead, leading to a broad range of economic and social changes."

Snapshot of standardization activities

Standardization activities are fuelling the current global conversation about the Internet of Things. ITU plays a pivotal global role in standardization in this area. It does so through its Joint Coordination Activity on Internet of Things (JCA-IoT), Internet of Things Global Standards Initiative (IoT GSI) and Focus Group on M2M Service Layer. JCA-IoT facilitates multilateral cooperation with other standards-developing organizations and ensures that work is not duplicated. IoT-GSI acts as an umbrella for Internet of Things standards-development worldwide. In addition, in September 2010, in Beijing, China, the Global Standards Collaboration created an M2M standardization task force (GSC MSTF) to promote harmonization.

Other major international standards bodies also have standardization initiatives on the Internet of Things. These include the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the Internet Engineering Task Force (IETF), which cooperates closely with the World Wide Web Consortium (W3C), ISO and IEC.

IETF's work has led to a protocol stack that can support the implementation of an interoperable Internet of Things. Related IETF protocols include IPv6 over Low-Power Wireless Personal Area Networks, IPv6 Protocol for Low-Power and Lossy Networks and the Constrained Application Protocol.

Of course, there is the foundational work across many standards committees at the Institute of Electrical and Electronics Engineers (IEEE) without which the Internet of Things could not be as effective.

There are also important national projects within standards-developing organizations in Canada, China, Europe, India, Japan, the Republic of Korea and the United States. Some of their M2M standardization work is being transferred to oneM2M, which was launched in July 2012.

The Internet of things is discussed and researched by many other groups producing guidelines, protocols and standards that can speed up its expansion. Examples range from the Bluetooth Special Interest Group, Broadband Forum, CDMA Development Group, Connected Device Forum, Coordination and Support Action for Global RFID-related Activities and Standardization, CTIA, GS1 (supply chain standards), IPSO Alliance, Dash7 Alliance, Dynamic Spectrum Alliance, EnOcean Alliance, GSMA, HART Communication Foundation, Home Gateway Initiative, IEEE Standards Association, International Society of Automation, IPv6 Forum, Modbus Organization, Near Field Communication Forum, Object Management Group, Open Geospatial Consortium, Open Mobile Alliance, OPC Foundation, Wave2M, Weightless Special Interest Group, ZigBee Alliance to Z-Wave Alliance.

Similar entities concentrating on vertical or regional markets are also part and parcel of the standards discussion concerning the Internet of Things. These include such bodies as the Continua Health Alliance, American Telemedicine Association, European Research Cluster on the Internet of Things, European Internet of Things Architecture, European Internet of Things Initiative, and various research and standards groups with an emphasis on intelligent transport systems, smart grid, smart manufacturing, supply chain, and so on.

A smart chair on which people can read and watch videos through tablet computers showcased at the fourth China International Internet of Things Expo in Wuxi, Jiangsu Province in September 2013

AFP

The open-source movement too produces significant standards and protocols on the Internet of things through, for example, the Contiki community, Eclipse M2M Working Group, Organization for the Advancement of Structured Information Standards (OASIS), TinyOS Alliance, the emerging Open Source Internet of Things in California (United States) and Open Source Solution for the Internet of Things into the Cloud (in Europe), as well as a host of open source hardware platforms (for example, Arduino).

Meanwhile, standards-based messaging and networking technologies, such as message queue telemetry transport (MQTT), advanced message queuing protocol (AMQP), data-distribution service (DDS), and the weightless "white space" networking specifications are generating interest regarding their ability to become the standard for M2M and the Internet of Things.

But that is not all the flurry of activity — think of all the trade groups that were created recently in the Internet of Things and M2M arenas, and the steadfast advocacy work of the Internet of Things Council. There are also corporate initiatives exploring promising avenues such as "central nervous system of the Earth",

"digital life", "industrial Internet", "Internet of everything", "Internet of things and services", "Internet of things and sensors and actuators", "smarter planet" and "social web of things".

Looking ahead

This brief overview does not delve into crucial aspects of the Internet of Things such as security, privacy and trust. These topics are being explored, for instance, in the European Commission under its Digital Agenda for Europe, the United States Federal Trade Commission and, more generally, by ITU (under the ICT Security Standards Roadmap). Big data and cloud computing are also related to the Internet of Things, but these links are not examined here.

Nevertheless, the existence of many interwoven ecosystems with kindred goals and challenges attests to the importance of the societal shift that the Internet of Things is bringing about. It induces a massive transformation that must be thoroughly understood, planned, and seamlessly and efficiently integrated into the socio-economic fabric for the benefit of humanity.

APNIC, Australia

What the WSIS Stocktaking 2013 report shows

Best practice from around the world!

The report on the World Summit on the Information Society Stocktaking 2013 reflects more than 700 of the latest stories collected by ITU between May 2012 and May 2013. This report — the fifth edition — illustrates examples of emerging trends in actions geared to bridging the digital divide and building an inclusive information society.

The World Summit on the Information Society (WSIS) — organized in two phases — in Geneva in 2003 and in Tunis in 2005 — produced four main documents. At the summit's first phase, world leaders issued a Declaration of Principles and a Plan of Action (with 11 Action Lines).

These were complemented in 2005 by the Tunis Commitment and the Tunis Agenda for the Information Society. The aim is for people everywhere to be able to share and use information and knowledge in order to achieve their full potential and attain internationally agreed development

objectives, including the Millennium Development Goals and the WSIS connectivity targets.

Knowledge sharing is an essential component of development within the WSIS process. Since 2004, ITU has maintained a stocktaking database as a tool

for collecting information and for regular reporting on WSIS-related activities.

Like in previous years, this year's report includes input from all stakeholders from around the world, representing governments, the private sector, international organizations, civil society and other entities, as well as from facilitators and co-facilitators of the eleven WSIS Action Lines, in response to ITU's call for updates and new entries. Each entry in the database highlights the efforts stakeholders make to implement WSIS connectivity goals.

Main highlights

The report shows that many governments and other stakeholders are continuing to work together towards connecting rural and marginalized areas and providing access to the Internet.

The important role that community centres and telecentres play in providing access to the Internet, to information, and to training in the use of information and communication technologies (ICT) cannot be overstated. The network of telecentres (KenTel) in Kenya, multipurpose community-service access points and public-information kiosks in Rwanda and community knowledge centres and women's community knowledge centres in Oman are just a few examples of the structures being established to provide access to ICT, information and ICT-literacy training, while also generating new jobs.

A number of initiatives are now focusing on gender mainstreaming, providing relevant training and personal capacity-building tools that help women enter the workforce. In the Dominican Republic, for instance, the Women in the Internet project aims to ensure that poor, young Dominican females have access to training opportunities and to the upper levels of the different ICT industry areas, such as telecommunication networks, programming and multimedia.

The development of e-accessibility policies is another trend of note that will make society more inclusive. Assistive technologies are being provided in schools, in the work environment and in public places to allow people with disabilities to access information. For instance, a number of countries, including Qatar, have taken major steps towards ensuring the introduction of e-accessibility policies, while others, notably Lithuania, have implemented initiatives that preserve and promote culture through improved access to electronic publications for persons with visual disabilities.

Youth is becoming a crucial element in the information society, and countries are recognizing the potential benefits of investing in young people. Incubators and innovation centres are offering platforms for raising awareness of ICT among young leaders and boosting entrepreneurship. For instance, the knowledge lab (kLab) project in Rwanda provides a space for the development of ICT solutions, bringing together experienced mentors and young

innovators. The Digital Incubation Centre (DIC) in Qatar gives new companies essential resources and help with commercial registration, as well as expert training and counselling. Silicon Oasis Founders (SOF) in the United Arab Emirates is a technology incubation centre established to help entrepreneurs refine their business proposals and implement their plans. New businesses will receive guidance and assistance in the form of services such as business set-up support, workspace facilities, networking opportunities with other IT professionals, videoconferencing and business consultancy, as well as financial, technical and marketing mentorship.

The national and sector strategies reported, in areas such as broadband, accessibility and e-government, are the catalysts required to shape the information society and bridge the digital divide. In many countries, multistakeholder collaboration constitutes the foundation for successful implementation of national strategies. There is no doubt that ICT are becoming increasingly integrated in society, a case in point being Kazakhstan, where the national programme seeks to embed ICT in all fields of economic activity and human life.

Many projects focus on providing free-of-charge Internet access. For example, the free Internet access points in Moldova or the techno- or i-parks in Mauritius. Providing connectivity to public institutions is also on the rise (for example in Egypt). Governments and other stakeholders continue to work and support initiatives

and projects that foster ICT integration in schools — Jordan being a good example of this.

The report includes many examples of projects and initiatives that have been launched to enable government agencies to share information securely at high speeds and cost effectively, and also to ensure the link between governments and citizens. Indeed, many countries have established government portals and call centres.

Houlin Zhao, ITU Deputy Secretary-General, comments that the WSIS Stocktaking Report series is a significant contribution to the process of identifying trends in implementing WSIS outcomes with a view to building the information society. "I believe that the best practices reflected in this report will serve as models to be replicated and will encourage stakeholders to move forward towards achieving the WSIS goals which are so important to us all," says Mr Zhao.

Call for contributions to the 2014 report

Stakeholders are invited to contribute updates and new entries for inclusion in WSIS Stocktaking Report 2014, which will be the sixth edition in the series and will be prepared for the WSIS+10 High-Level Event to be held in April 2014. All stakeholders are encouraged to provide their input at www.wsis.org/stocktaking by completing an online questionnaire. The closing date for input is 1 December 2013. ●

Feedback from the winners of WSIS Project Prizes 2013

Success is more than just winning the WSIS Project Prizes contest. It also means continuing to work on the projects and achieve further benefits for society. Some of the winners of WSIS Project Prizes 2013 have updated us on their progress in recent months, and we are pleased to highlight a few of their comments here.

Capacity building

Since winning the prize, Italy's Electronic Information for Libraries Public Library Innovation Programme has released a number of impact case studies for Africa and will launch a new call for proposals to support public library services that use technology to improve the livelihoods of people in their communities. An innovation award for creative use of ICT by public libraries was launched on 9 September 2013.

Rima Kupryte, Director of Italy's Electronic Information for Libraries scheme says "Receiving the 2013 WSIS Project Prize was a tremendous honour and an important recognition that public libraries are powerful partners in development. Winning such an esteemed prize gave us extra validation that our innovative approach connecting libraries with technology is working."

AFP

Cultural diversity and identity, linguistic diversity and local content

"The contest and the prize showed our stakeholders the relevance of our project, allowing us to expand it and increase our budget," says Santiago Amador, Director of ICT Adoption and Access, at Colombia's Ministry of Information Technologies and Communications, which won a prize in the category of cultural diversity and identity, linguistic diversity and local content with its project "En mi idioma" (In my language), in cooperation with Colnodo (an association of non-profit non-governmental organizations).

The name of the project has since changed from "En mi idioma" to "Origen" because the objective now is to preserve not just language but the entire cultural heritage, using ICT and digital content.

E-business

Work on automating the delivery of different types of permits has continued since the prize award for the E-licence Information System project of Kazakhstan's Ministry of Transport and Communications, National Information Technologies (NITEC), and Ministry of Regional Development. This work is scheduled to be completed in 2014. Besides e-licences, customers will be able to obtain all types of permits through the e-licence portal. Special regulations are being passed to legitimize the issue of each type of permit.

Winning the prize "served as a great incentive and became the pride of the entire project team, including both public authorities and the business community. It gave this national project high visibility in the international arena. Experts from several countries have already visited Kazakhstan to learn from our experience" says Ruslan Ensebayev, Chairman of NITEC's Board.

Building confidence and security in the use of ICT

The prize in building confidence and security in the use of ICT went to the Digital Training through Mobile Classrooms project from Ecuador's Ministry of Telecommunications and Information Society.

Patricio Carvajal, Digital Literacy Director of Ecuador's Ministry of Telecommunications and Information

Society, says that for him "Winning the prize means that even small nations can set an example to the world on how to design and execute successful ICT projects that make new technologies accessible to poor people, in line with the Millennium Development Goals. Our team has been warmly congratulated in our country, and other countries have asked us for advice. We are very happy to share our expertise and collaborate with those countries to help them replicate our model."

International and regional cooperation

The Child Helplines and Telecoms project from Child Helpline International (the Netherlands) won a prize in the category of international and regional cooperation. Thomas Müller, Deputy Head of Programmes, Child Helpline International, says that winning the contest "gives official recognition to your work and confirms that you are doing the right thing. In the case of Child Helpline International, the WSIS prize gave us great motivation to keep engaging with ITU and its members around the world in order to empower children and young people, and to give them a voice through communication technologies."

Role of public governance authorities and all stakeholders in the promotion of ICT for development

The Safeer project from Saudi Arabia's Ministry of Higher Education won a prize in the category of role of public governance authorities and all stakeholders in the promotion of ICT for development. According to Khaled H. AlAjmi from Saudi Arabia's Ministry of Higher Education, winning the WSIS prize has acted as "an incentive for the Safeer team to further transform the way e-government programmes work so that they offer a more accessible, available, secure and seamless service to citizens."

ITU/J.M. Ferré

WSIS PROJECT PRIZES | 2014

Could your project win a 2014 WSIS prize?

Hurry! The closing date for the WSIS Project Prizes 2014 competition is 1 November 2013.
All stakeholders are invited to submit their applications via www.wsis.org/prizes.
The WSIS Project Prizes 2014 contest, launched on 5 September 2013, provides a platform to identify and showcase success stories and models that could be easily replicated, to empower communities at the local level.
The prizes recognize efforts to add value to society and move closer towards achieving WSIS goals.

Information about all the winners of WSIS Project Prizes 2013 is available from ITU News *(https://itunews.itu.int/En/3942-Prize-winning-projects.note.aspx).*

AFP

▌ *Tashkent, Uzbekistan, hosts ITU regional workshop*

Quality of service and consumer protection

Tashkent, Uzbekistan, was the venue for an ITU regional workshop for the Commonwealth of Independent States (CIS) on quality of service and consumer protection in the field of telecommunications, and information and communication technologies (ICT). The workshop, held from 22 to 24 May 2013, was organized in cooperation with Uzbekistan's State Committee for Communication, Informatization and Telecommunication Technologies.

Participants discussed the role of the State in ensuring consumer protection and in regulating the quality of the services provided by telecommunication and ICT companies. Based on the debates, participants concluded that legislation and regulations have a significant role to play in ensuring quality of services and consumer protection in CIS countries, and that they should be harmonized throughout the region. Where the same technologies are used, quality standards should be identical.

Participants saw that there was room for improvement in the existing cooperation between governmental and regulatory authorities. They recommended that CIS countries share legal and regulatory texts dealing with quality of service and consumer protection, as a way of helping countries that still need to draft laws or regulations in these areas.

Food for thought

During the ten sessions of the workshop, 20 presentations were made on different aspects of telecommunication and ICT services. Most of the presentations dealt with ensuring service quality in this era of converging services and technologies.

Specialists from telecommunication administrations, and from research and scientific institutes, talked about quality monitoring, current quality standards and the drafting of new standards. The relevant ITU Telecommunication Standardization Sector (ITU–T) Recommendations were described and explained.

Hot topics

Two round tables provided an opportunity for a frank exchange of opinions. Among the subjects discussed were the legal basis of consumer rights to quality and protection and regulatory approaches to implementing those rights.

Some participants raised the possibility of imposing penalties on providers that fail to maintain required quality standards, or that violate consumer rights.

Speakers stressed the importance of respecting the rights of people with disabilities, and of taking account of the needs of consumers in different age groups. They called for mutual understanding between the State, businesses and consumers.

Participants identified topics of specific concern to the CIS countries, including number portability, numbering resources, and the creation of shared infrastructure.

Successful event

The workshop was attended by 49 representatives of telecommunication administrations, regulators, service providers, scientific and research institutions, and universities from eight ITU Member States in the CIS (Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Uzbekistan and Ukraine).

Judged against the specific goals set in ITU's Operational Plan for 2013, the workshop was a success. Participants agreed that ITU should continue to hold workshops of this kind in the future.

Children going safely to school

The Shiojiri child tracking project

Shiojiri city in central Nagano, Japan, is facing up to the challenge of protecting its citizens, especially children and elderly people. The hub of this effort is the Shiojiri Incubation Plaza, which acts as the engine of socio-economic development based on information and communication technologies (ICT).

Along with stimulating regional industry, the Incubation Plaza is a focal point for research and development. An ambitious strategic plan has been drawn up to build sensor systems to track and protect children, to monitor river water level and debris flow, to watch out for dangerous birds and beasts, and to monitor the public bus transport system. The child tracking system described here is the first to be up and running.

Child tracking system

At the end of the ancient "salt route" from the Sea of Japan, Shiojiri spans an area of some 290 square kilometres. The leafy urban area contains 25 555 households and ten primary schools.

In 2005, the city authorities agreed on a basic plan to maintain the safety of children going to primary school and returning home. The housing density is high in the heart of the urban area, which makes it easier for the tracking system to provide full coverage.

Mobile phones in an ad hoc network

The system uses an ad hoc communication network. This is a wireless local area network (WLAN) based on a cellular architecture. There is no need for any pre-existing infrastructure to allow communication between the network's radio stations. The various radio stations interconnected by the wireless network operate autonomously. Each station must be located within the transmission range of its partners (see Figure).

Ad hoc network configuration
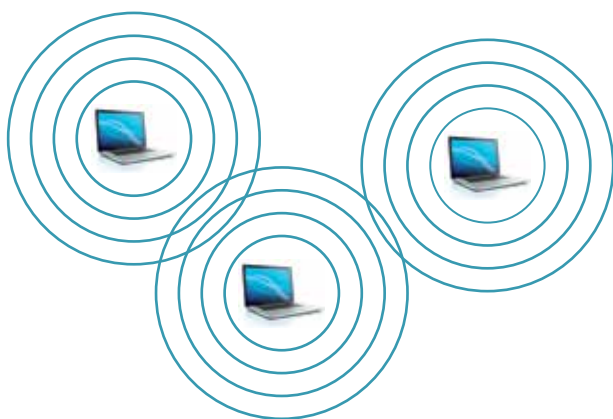
If the radio stations are equipped with suitable routing software, node-to-node communication is possible and all stations within the coverage area can be reached.

The viability of the system depends on the 130 kilometres of optical fibre that the city laid in the year 2000, together with the 640 radio stations that have been installed and connected to the network.

Successful pilot test

The Shiojiri Incubation Plaza worked with Shinshu University to test the coverage of an emergency signal broadcast from a mobile phone. The test, which successfully took place in June 2008, covered the neighbourhoods of Shiojiri's ten primary schools (see map).

Map showing the location of Shiojiri's ten primary schools and the coverage of the test emergency signal
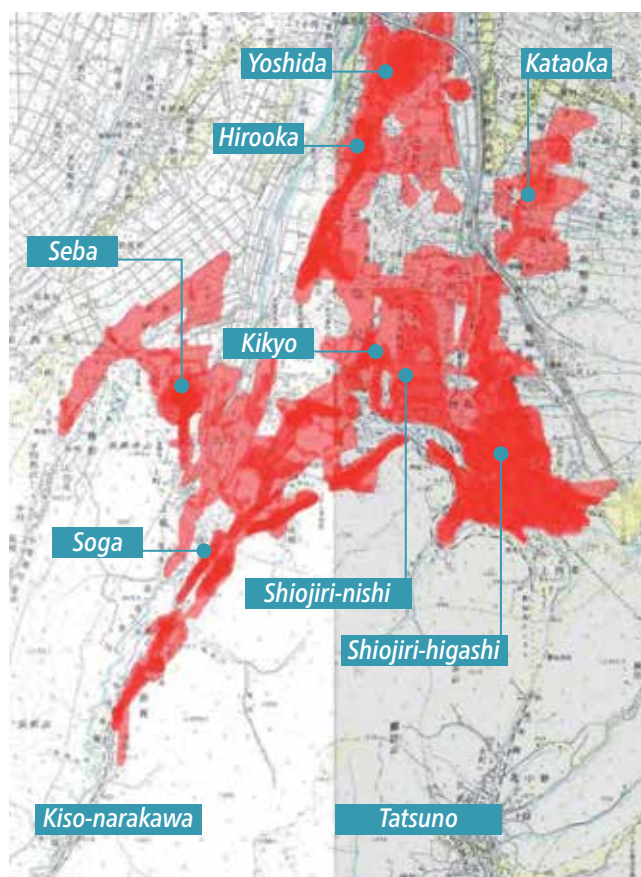
How the child tracking system works

Each child carries a cordless handset. If children are within wireless station coverage, their location can be identified. While a child is walking, the radio signal is emitted every three minutes. When the child stops, the signal is emitted just once per hour, to save battery power.

A child who feels in danger must pull the strap of the cordless handset. This causes a buzzer to sound, and an emergency radio signal is emitted. The emergency signal has priority over other signals received at the server in the information centre. An emergency e-mail message is then sent to the child's parents reporting the location of the emergency site, with map references. Information on the child's movements is maintained for a week.

Parents can also register a particular radio station on the city website. They are then notified when the child passes by that station, giving them an indication of when the child returns from school.

Future plans

The Shiojiri authorities intend to build up the city's basic communication infrastructure and develop a series of e-applications.

The data collected from the ICT sensing system, which now covers the whole city area, will be saved in the management centre housed in the Shiojiri Information Plaza. This information will be collated with demographic data and used not only for administrative purposes, but also to improve the safety of inhabitants and to protect the environment.

Tribute to Mohamed Ezzedine Mili

Secretary-General of ITU from 1967 to 1982

ITU

Former ITU Secretary-General Mohamed Ezzedine Mili was born in Djemmal, Tunisia, on 4 December 1917 and passed away on 5 August 2013 aged 95. Remembering Mr Mili is to remember his legacy in setting telecommunication development on its inclusive worldwide path, with his focus on international technical cooperation to help developing countries join the global network.

In I965, Mr Mili was elected Deputy Secretary-General of ITU at the Plenipotentiary Conference in Montreux, Switzerland. He took up the duties of Secretary-General on 20 February 1967 following the death of the then Secretary-General, Manohar Balaji Sarwate. Mr Mili was elected Secretary-General of ITU at the subsequent Plenipotentiary Conference in Malaga-Torremolinos, Spain, in 1973, and served in this position until 31 December 1982.

Mr Mili studied in France at the *Ecole Normale Supérieure* (Saint-Cloud) and the *Ecole Nationale Supérieure des Télécommunications* (Paris), graduating as a telecommunications engineer in 1946. He joined the Tunisian Posts and Telecommunications (PTT) Administration in 1948. In 1957, he was promoted to become Chief Engineer and took up his duties as Director-General of Telecommunications at the Ministry of PTT. In that capacity, he modernized the Tunisian telephone network by introducing the automatic crossbar-type system.

Before joining ITU, Mr Mili had, since 1956, led the Tunisian delegation at many of ITU's major events, including the Plenipotentiary Conferences of 1959 and 1965, the Plenary Assemblies of the International Telephone and Telegraph Consultative Committee (CCITT) of 1958, 1960 and 1964, and the Plenary Assembly of the International Radio Consultative Committee (CCIR) in 1963. He was also active in several CCITT study groups, notably those that dealt with telephone switching and signalling and the worldwide automatic and semi-automatic telephone network, and in CCIR study groups in the areas of space systems and radio astronomy and radio-relay systems.

Mr Mili was actively involved in the work of the World Plan Committee, which was responsible for planning the world telecommunication network. In 1961, he was elected Vice-Chairman of the Plan Committee for Africa and became its Chairman in 1964. From 1960 to 1965, Mr Mili represented Tunisia on the ITU Administrative Council and was elected Chairman of its 19th Session in 1964.

During his 16 years as Secretary-General, Mr Mili led ITU with great passion, vision and innovation. His first priority was to ensure that ITU paid special attention to the needs of developing countries. For this purpose, he created the Department of Technical Cooperation to help these countries improve their telecommunication infrastructure and networks. The Department of Technical Cooperation coordinated its work with the United Nations Development Programme to that end.

Giant telephones formed the centrepiece on the stand of the Administration of the Federal Republic of Germany at TELECOM 75

ITU

Through the Administrative Council (now simply known as the Council), he initiated the establishment of World Telecommunication Day, the first of which was celebrated on 17 May 1968. ITU continues that celebration with World Telecommunication and Information Society Day.

Mr Mili also initiated the creation of world telecommunication exhibitions. The story of ITU Telecom World starts with the success of TELECOM 71, the very first World Telecommunication Exhibition, held in Geneva, with the theme "Message to the XXIst Century".

As noted in the ITU Telecom World Timeline (*ITU News,* October 2012), "This was the first time that an exhibition with such a vast range of telecommunication equipment had been organized on a world scale with the participation of administrations of ITU member countries, private companies and industrial firms. Spacecraft and satellites occupied a prominent place. Satellites used for public telecommunications, meteorology, mass education or radionavigation were to be seen alongside models of different types of earth stations."

Initially held every four years — hence the name the "Olympics of telecommunications" — these exhibitions grew to become the largest and most important telecommunication events in the world, providing a global showcase for the latest technologies, news and views. Apart from the exhibition, there were also several other attractions — technical symposia, an international film festival "The Golden Antenna", and an international competition "Youth in the Electronic Age".

Mr Mili's enthusiasm was palpable at all the three events he led: TELECOM 71, TELECOM 75 and TELECOM 79. At TELECOM 71 he said: "All those who had the opportunity — and the good fortune — to visit the various stands were able to appreciate the fundamental role played by ITU in the spectacular evolution of telecommunication techniques and in the rapid expansion of the world network to which it has made such a large contribution."

The importance of telecommunications for economic, social and cultural development and the central role played by ITU were officially recognized by the United Nations in its resolution No. 36/40, adopted in 1981. In this resolution, the General Assembly proclaimed "1983, World Communications Year, with the International Telecommunication Union serving as the lead agency for the year." Pleased with this recognition, Mr Mili in his address at the opening ceremony of the Plenipotentiary Conference in Nairobi, Kenya, in September 1982 commented that "The fact that ITU has been designated by the United Nations as the lead agency for the World Communications Year shows the confidence it inspires in this highest of international assemblies."

We all owe a debt of gratitude to this great man, who believed in global communications and contributed enormously to building our networked world.

Tribute to Kathleen G. Heceta

Second woman to chair the ITU Council

ITU/A. de Ferron

Kathleen G. Heceta, former Deputy Commissioner of the National Telecommunications Commission of the Philippines, passed away on 15 July 2013.

Ms Heceta, an attorney, was the second woman to chair the ITU Council in 2000. Under her chairmanship, the Council in July 2000 discussed the status of the Union's reform process and encouraged Member States and Sector Members to contribute to the debate. The Council also decided to prepare for a World Summit on the Information Society, to be held under ITU's leadership in close cooperation with interested United Nations agencies. Strategic partnerships with public and private entities were also envisaged. In addition, the Council decided that the third World Telecommunication Policy Forum would be convened in March 2001 in order to enable stakeholders to exchange views on Internet protocol telephony.

The results of Council 2000 reflected inclusiveness, a theme close to Ms Heceta's heart. Her concern with inclusiveness also prompted her advocacy for gender equity. Ms Heceta, who took over the Council chairmanship from Lyndall Shope-Mafole, then Plenipotentiary Minister of Communications at the Embassy of South Africa in Paris, said that "the election of two women in a row

— one at the end of the 20th century and now as we start the 21st century — presents a firm conviction in support of gender equality". Ms Heceta saw the vote of confidence given to women at the ITU Plenipotentiary Conference held in Minneapolis in 1998 as an inspiration to many qualified women seeking gender equality. In her view, the world should recognize that society as a whole would benefit from equal participation of women and men in policy and decision-making.

When the "troika" of the Council was established in 2001, Ms Heceta became its first woman member. Troika (meaning a group of three) consists of the past, current and future chairmen of the Council. These three members provide for a smoother transition and continuity in chairing Council sessions, and work largely by electronic means.

Ms Heceta held a clear vision of ITU's image in the context of the global information economy. "The Union's credibility and relevance to its membership, especially in the policy domain, will be vital in establishing an acceptable global framework and a universal mechanism for moral, if not legal, enforcement of standards and access in the borderless world of telecommunications," she said.

Tribute to Marie-Thérèse Alajouanine

First woman ever to chair an ITU–T study group

ITU

Marie-Thérèse Alajouanine, a valued and prolific contributor to the work of ITU, was born in 1950 and passed away on 27 June 2013, aged 63. As head of delegation to many ITU conferences, she regularly exhibited a much-appreciated voice of reason and the spirit of compromise so often necessary to move forward on difficult issues at the international level.

Ms Alajouanine led various ITU groups with vision and energy. In 2004, she was appointed Chairman of ITU's Telecommunication Standardization Sector (ITU–T) Study Group 2 on operational aspects of service provision, networks and performance. The appointment made her the first woman ever to chair an ITU–T study group and, between 2004 and 2012, was an undeniably powerful force behind this international group responsible for telecommunication numbering plans.

She also headed the Editorial Committees at the 2002, 2006 and 2010 Plenipotentiary Conferences, at the World Telecommunication Development Conference 2010, the World Radiocommunication Conference 2012, the World Telecommunication Standardization Assemblies in 2004, 2008 and 2012, and the World Conference on International Telecommunications in 2012. In 2000, she served as Vice-Chairman of the World Telecommunication Standardization Assembly.

Ms Alajouanine was an active participant in the groups of the European Conference of Postal and Telecommunications Administrations (CEPT) that dealt with ITU matters. In particular, she chaired the CEPT project team that had been established to prepare European positions for the World Telecommunication Standardization Assembly in 2004.

In her home country, France, Ms Alajouanine was a pillar of public policy in the telecommunication arena. A member of the Corps of Engineers, she was a founder of *l'Autorité de Régulation des Communications Electroniques et des Postes* (ARCEP), the French national regulator. She occupied various positions within *France Télécom* between 1975 and 2001, including: Deputy Director of the GSM programme and Deputy Director for international standardization. From 2001 until her untimely death, she was responsible for international standardization coordination in ARCEP.

On 1 January 2013 she was nominated by the President of France as *Chevalier de la Légion d'Honneur,* an outstanding and deserved accolade.

Tribute to Abderrazak Berrada

Former member of the International Frequency Registration Board

ITU

Abderrazak Berrada, former member of the International Frequency Registration Board (IFRB), was born on 23 October 1933, in Morocco, and passed away on 21 April 2013, in Geneva, Switzerland, aged 79.

Highly visible within the Union and with enormous influence on the decisions taken by the membership, Mr Berrada was Chairman of the IFRB in 1968, 1971, 1975, 1980, 1984 and 1989. He chaired Committee 6 (Constitution and Convention) at ITU's Plenipotentiary Conference 1998 in Minneapolis, which examined proposals for amending the Constitution, Convention and Optional Protocol. He then chaired the Group of Experts to prepare for ITU's Plenipotentiary Conference 2002 on ITU Reform.

Mr Berrada graduated from the *École supérieure d'électricité* in Paris as a radio and electronics engineer. Formerly Secretary-General of the PTT Ministry of Morocco, he took part in many conferences of the Union before he was elected member of the IFRB Board by the Montreux Plenipotentiary Conference in 1965.

Official Visits

During July and August 2013 courtesy visits were made to ITU Secretary-General Dr Hamadoun I. Touré by the following ministers, ambassadors to the United Nations Office and other international organizations in Geneva, and other important guests.

Leonel Antonio Fernández Reyna, Former President of the Dominican Republic and Dr Hamadoun I. Touré, ITU Secretary-General

Roswitha Grass, World Circle of the Consensus (*Cercle Mondial du Consensus,* CMDC) and Dr Hamadoun I. Touré, ITU Secretary-General

Ambassador Theodor H. Winkler, Director of the Geneva Centre for the Democratic Control of Armed Forces and Dr Hamadoun I. Touré, ITU Secretary-General

Christina Figueres, Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC) and Dr Hamadoun I. Touré, ITU Secretary-General

Dr Hamadoun I. Touré, ITU Secretary-General and Mohsen Naziri Asl, Ambassador of the Islamic Republic of Iran

Abdelrahman Mohamed Abdalla Dhirar, Ambassador of Sudan and Dr Hamadoun I. Touré, ITU Secretary-General

Marius Fransman, South Africa's Deputy Minister of International Relations and Dr Hamadoun I. Touré, ITU Secretary-General

Neelie Kroes, Vice-President of the European Commission responsible for the Digital Agenda and Houlin Zhao, ITU Deputy Secretary-General

Mignon Clyburn, Acting Chairwoman of the Federal Communications Commission (FCC), United States and Houlin Zhao, ITU Deputy Secretary-General

Blaise Louembe, Gabon's Communications and Digital Economy Minister and Houlin Zhao, ITU Deputy Secretary-General

Houlin Zhao, ITU Deputy Secretary-General and Azdine El Mountassir Billah, Director General of Morocco's *Agence Nationale de Réglementation des Télécommunications* (ANRT)

Pascal Clivaz, Deputy Director General of the Universal Postal Union's International Bureau and Houlin Zhao, ITU Deputy Secretary-General

ITU NEWS

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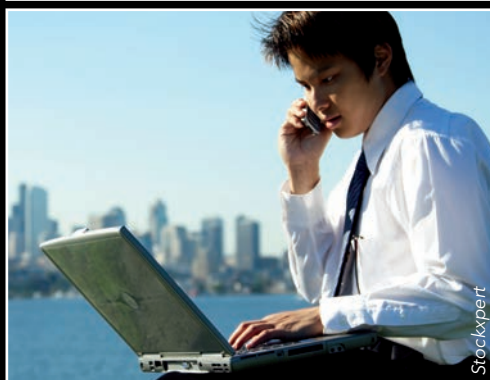# Tells you what's happening in telecommunications around the world

Every time you make a phone call, use e-mail, watch television or access the Internet, you benefit from the work of ITU.

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