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Exciting times ahead in 2015

Houlin Zhao, ITU Secretary-General

As the nineteenth Secretary-General of ITU, it is a great pleasure to greet you all in this first edition of ITU News for 2015. As I look ahead to the coming year, and my four-year term as ITU Secretary-General, my three key watchwords will be Vision, Action, and Harmony:

- **Vision** in the way we tackle ITU's priorities, as defined by our members at the Plenipotentiary Conference in the Republic of Korea;
- **Action** in our efforts to energetically execute and implement these priorities to the satisfaction of those members;
- And **Harmony** in our approach to collaborating with an increasingly wide range of actors in today's fast-moving, fast-growing information and communication technology (ICT) sector.

I look forward to leading the Union towards an even brighter future at the heart of the ICT sector — and especially so in this, the ITU's 150th anniversary year. Indeed, 2015 promises to be another exciting and productive year committed to serving the needs of our membership, and we look forward to engaging with Member States, Sector Members, Associates and Academia at many prominent ITU events during the year, including: Council 2015, in Geneva, from 12 to 22 May; the WSIS Forum, also in Geneva, from 25 to 29 May; the Global Symposium for Regulators, in Gabon, from 9 to 11 June; ITU Telecom World 2015, in Budapest, from 12 to 15 October; Radiocommunication Assembly 2015, in Geneva, in the last week of October; the World Radiocommunication Conference 2015, which will take place in Geneva right through the month of November; and the World Telecommunication/ICT Indicators Symposium, in Japan, in December.

Throughout the year, we will be celebrating 150 years of international cooperation among governments, private companies, academia and other stakeholders, with the main celebrations taking place during the 2015 Session of ITU Council, in Geneva, on 17 May. Let me take this opportunity to warmly invite you all to join in the ITU's 150th Anniversary celebrations, and also to nominate candidates for the special ITU 150 Awards. Nominations are open until 15 March 2015, and I strongly encourage your candidatures.

In closing, let me acknowledge the vital role of young innovators, entrepreneurs, small- and medium-sized enterprises (SMEs), start-ups and technology hubs as drivers of innovative and practical ICT solutions for accelerating the Connect 2020 agenda that was approved by membership at the 2014 Plenipotentiary Conference, and increasing connectivity and delivering the greatest benefits to developing countries.

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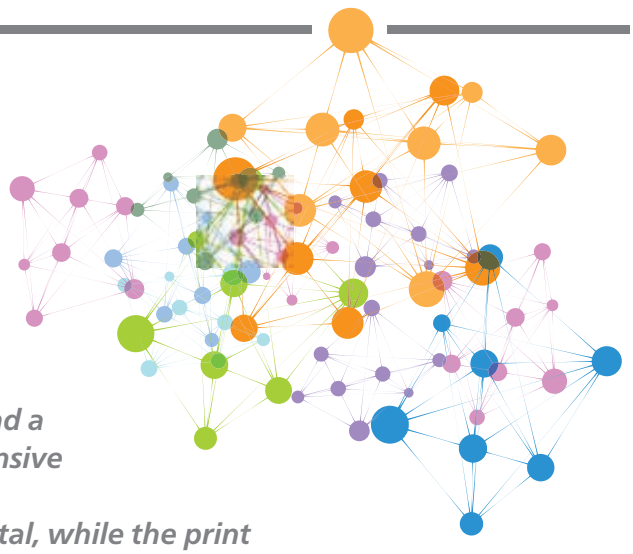
Forecasting the Future

Note from the Editor



In 2016, ITU News will be moving to a fully digital format.

To pave the way for this transition, more content and a richer and more comprehensive selection of articles will be available on our online portal, while the print edition will present a more concise selection of highlights from ITU's latest news and analysis.

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Top tech predictions

The New Year is characterized by a crop of telecom predictions from many research firms and major consultancies. This short article briefly summarizes a few key trends apparent from this year's projections. For 2015, many of the forecasts coming from major research companies include the growth of mobile and next-generation software, cloud computing, the Internet of Things, and of course, social media and big data. A number of analysts have also concentrated on the impact of technological changes on firms or on consumers.

Convergence is strongly evident, with many forecasts for telecom crossing over into the domain of information technology (IT), while telecom network issues are increasingly feeding back into the IT and Internet domains (consider the ongoing debate over net neutrality). The International Data Corporation (IDC) projects that global IT and telecom spending together will grow by 3.8% over the course of 2015 to around USD 3.8 trillion for the year.

Indeed, many of IDC's 2015 telecom predictions focus on the **changing role of the telco** in a converging industry, exploring how telcos will move into API business, value-added services, precision mobile advertising, managed security services, and adopt network virtualization to improve their profit margins.

This is in line with many of the outcomes from ITU's **Leadership Summit: The Future in Focus**, where one keynote speaker suggested that every company may effectively become a software company in one way or another in future (see the separate article on ITU Telecom World 2014).

Both Ovum and Infonetics explore the **slowdown in telecom revenues,** especially in Europe. According to Infonetics, global mobile service revenue for the first half of 2014 rose barely 0.5% over the same period in 2013. However, Infonetics injects a positive note insofar as mobile data services (text messaging and mobile broadband) rose in every region, thanks to the increasing use of smartphones, and forecasts that the datacom market should continue to be healthy in 2015.

According to Ovum (the research arm of Informa), **mobile subscriptions will grow to 8.5 billion** by the end of 2019. ITU predicts the number of Internet users will exceed 3 billion in 2015. WeAreSocial/Internet World Stats forecasts that mobile will help push **Internet penetration** beyond 50% of the world's population during late 2016, with some 2.7 billion smartphone "connections" worldwide (it is not altogether clear whether this means subscriptions or actively used phones). In their authoritative "Technology, Media and Telecommunications (TMT) Predictions report", Deloitte predicts that 1.4 billion smartphones will sell worldwide in 2015, with smartphone sales exceeding the sales of the PC, television, tablets and game console sectors combined in terms of both units and revenues. As mobile devices proliferate, Gartner predicts a shift in focus towards serving the *needs of users* in diverse contexts and environments, rather than just the features and *functionality of devices*. Gartner foresees that phones and wearable devices will form part of an expanding computing environment (including consumer electronics and connected screens).

And it is not just humans who are getting connected. Many analysts agree that the **Internet of Things (IoT)** is coming of age, and foresee strong growth in IoT in their predictions. Deloitte forecasts that, in 2015, one billion wireless IoT devices will be shipped, up 60% on 2014, resulting in an installed base of 2.8 billion connected devices by the end of 2015. IDC predicts that IoT spending will exceed USD 1.7 trillion, up 14% from 2014 (and may reach USD 3 trillion by 2020). In contrast to many analysts who foresee a large part of the IoT as comprising wireless sensor networks, IDC sees the "industrial Internet of Things" as a mainly fixed-line phenomenon for the immediate future, forecasting that fixed-line networks are expected to carry over 90% of traffic for the industrial IoT.

Ericsson ConsumerLab's annual report considers IoT from a consumer's perspective, suggesting that consumers want technology and connectivity to be integrated into all facets of their daily life. Ericsson also sees 2015 as a pivot point between streamed video and broadcast TV, and predicts that, for the first time, consumers will watch more streamed video than broadcast TV in 2015. PC Mag expects wearables to become "probably" the most popular category in tech in 2015.

"Intelligence" is another widely used word, although opinions differ as to who — or more accurately, what — is becoming more intelligent. For IDC, it is the *networks*. For others, it is our entire connected *environment*. For GP Bullhound, a boutique investment bank specializing in technology companies, it is the *smart devices* in IoT which are becoming more intelligent, thanks to innovation in software and better utilization of data. From GP Bullhound's point of view, wearable devices (such as Fitbit and Jawbone) have proven helpful in tracking real-world activity and generating data, but they generally require too much input from consumers to make them genuinely "intelligent". More advanced devices will run always-on, context-aware applications in the background, which will automatically collect data from multiple sources, adapt, learn, update and, in some cases, take action without inputs or guidance from users.

Some commentators take this a step further, suggesting that mobile traffic patterns and network loads are altering in response to network-initiated service requests (as found with smartphones via Long-Term Evolution (LTE) networks, for example). Mobile operators may need to review their network architecture, topology, and functionality to carry 4G traffic successfully, while providing good customer experience, and bolstering their profit margins. Two things are certain — innovation and evolution in telecommunication/ICT networks continue at an exciting pace, and no one can get bored watching or working in telecoms!

International Telecommunication Union

CONFERENCE PREPARATORY MEETING FOR WRC-15

CPM15-2 (Second Session)

GENEVA, SWITZERLAND
23 MARCH - 2 APRIL 2015

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ITU Telecom World 2014 Opening Ceremony

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ITU Telecom World 2014

Viewpoints from Doha

ITU Telecom World 2014, a platform for high-level debate, knowledge-sharing and networking for the global information and communication technology (ICT) community, took place on 7–10 December 2014 in Doha, Qatar. The event was hosted by the Government of Qatar, with the support of leading international communications company, Ooredoo. It was attended by a range of well-known figures from the ICT world: ministers, consultants, policy shapers, leading industry CEOs, renowned academics, and futurists.

The show floor highlighted technologies and investment opportunities through the presence of national and thematic pavilions and industry showcases. Top global players included Cisco, Huawei, Intel, LS Telcom, Nokia, Ooredoo, Rohde & Schwarz, Vodafone and ZTE, along with countries Argentina, Azerbaijan, Cameroon, Chad, China, Hungary, Nigeria, Malaysia, Qatar, Tanzania, Thailand and Zimbabwe, while Kenya, Uganda, South Sudan and Rwanda came together within the Smart Africa zone. Forum discussions at the event covered the key trends and developments in technology, regulatory and policy issues, business models, services and applications, focusing on three major scenarios: disruption,

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ITU Telecom World 2014 Opening Ceremony. From left to right: Sheikh Abdullah Bin Mohammed Bin Saud Al Thani, Chairman of the Board of Directors, Ooredoo, Qatar; Dr Hamadoun I. Touré, ITU Secretary-General (now former Secretary-General); and Hessa Sultan Al Jaber, Qatar's Minister of Information and Communications Technology

cross-sector partnerships and the intelligent future. Moderators, speakers and panellists spanned a mix of high-level players from government, as well as all facets of the industry. Sessions took a variety of different formats from top media-moderated Big Conversations to ministerial round tables and panels.

DAY ONE — 7 December 2014

The spectacular **Opening Ceremony** at the Qatar National Convention Centre assembled an impressive line-up of high-level participants. Sheikh Abdullah bin Nasser bin Khalifa Al Thani, Prime Minister of Qatar, stated, "We are extremely proud to host a great number of telco corporations as an important hub". Sheikh Abdullah Bin Mohammed Bin Saud Al Thani, Chairman of the Board of Directors, Ooredoo Group, underlined the need for partnership: "Among us are many of the world's largest technology companies, high-ranking government representatives and policy shapers from across the world, as well as a new generation of entrepreneurs and app-developers. Feel our power, our combined experience and know-how. Together we can make the future happen sooner".

An exclusive one-day **Leadership Summit: Future in Focus** offered an inspiring journey into the future of the ICT industry, business and society. Renowned futurists and international experts came together with leaders from public and private sectors to explore scenarios to understand how policies, strategies, business models and regulatory approaches might develop.

Panellists agreed that the world is going digital very fast. The convergence of many different strands of technology (such as solar technology, bio-tech, nano-tech, neurotechnology, 3D printing, sensors and artificial intelligence) is pushing down the half-life of an average business competency from 30 years to 5 years. Three billion newly-networked minds coming online are unleashing innovation, creation, and disruption, all influenced by local language, culture and context, taking us in new

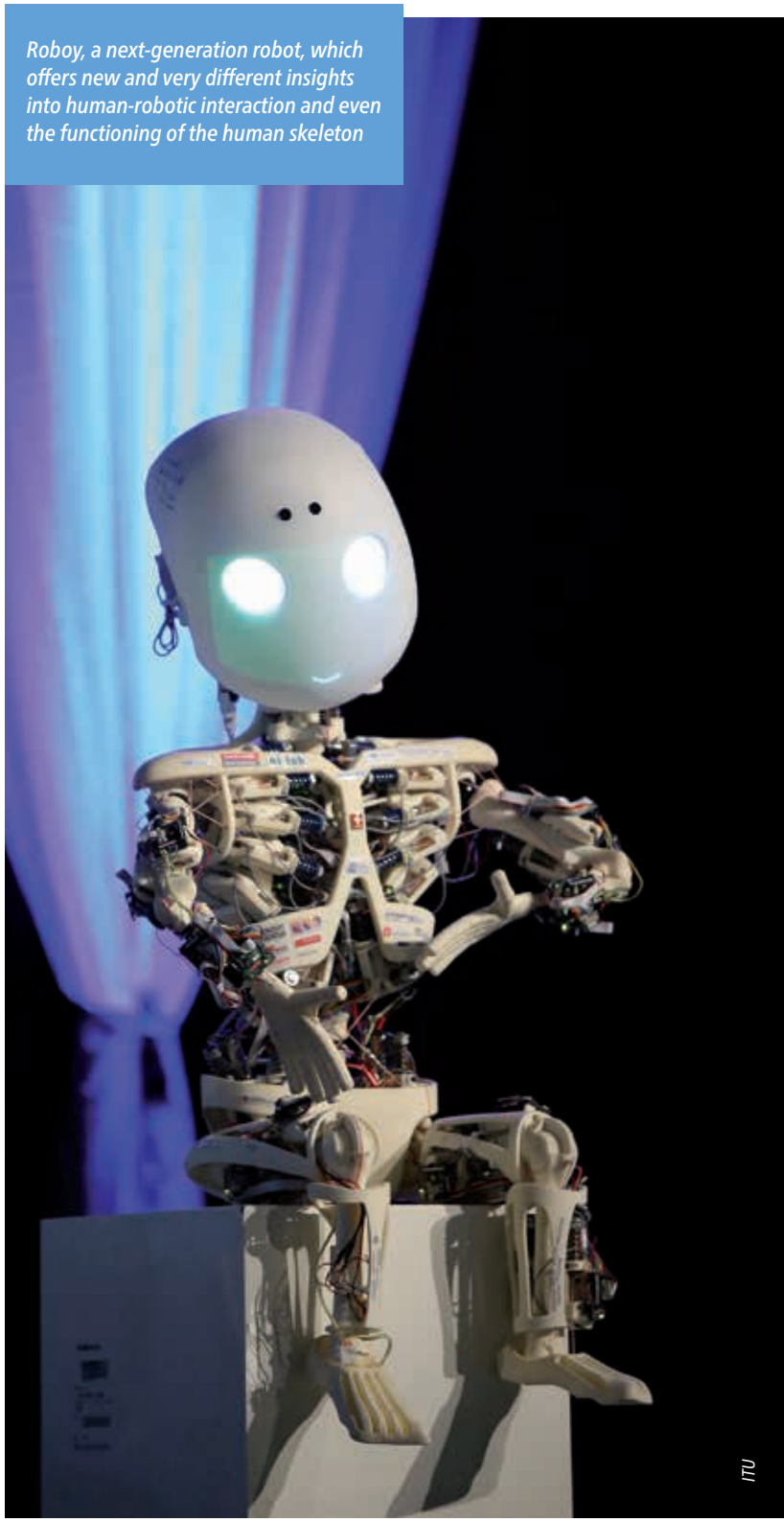
directions via radically different intermediaries — today, a third of 15–30 year olds get their online news solely from Facebook!

The Summit also saw the demonstration of Roboy, a next-generation robot, which offers new and very different insights into human-robotic interaction and even the functioning of the human skeleton. One panellist stated that robots are neither a tool nor technology, but partners, and may even become competitors. Alarm was expressed that robots might exploit us as humans, forcing us to produce successful models in ever greater numbers, or let less-successful versions die — just like biological evolution. The real question is not whether we wish to continue with robots or not — robots are already here, in large numbers — but whether we can guide their development without being overrun: will robots understand us or scare us?

The Summit agreed that policy-makers need to stay abreast of a huge range of upcoming technological developments in order to respond with adequate strategies. However, panellists expressed concerns over the growing gap between the pace of technological change and that of regulatory evolution. Telcos' core business now goes far beyond simply providing connectivity — competitors now come from a number of other industries (see article on The great telco conundrum). Today, change is the norm, rather than stability. Telcos must manage data and become a trusted custodian of consumers' data, creating a new class of economic asset, while keeping data safe and secure. New issues are arising as to who owns the data, and whether/how to regulate the use of others' data. In the future, according to one keynote speaker, **every company may become a software company.**

There were also debates on **Natural disasters, the Road to 5G and LTE standardization.** The challenge in 5G is to build an effective ecosystem with cells, machines, connected devices and backhaul. In theory, 5G could enable all Seoul's subway passengers to watch HDTV channels simultaneously. However, most future uses of 5G are still unknown, and network management is complex. LTE standardization should include best-practice knowledge from countries already using it — such as Qatar, where LTE was introduced three years ago as a pilot for data and video. The first day also witnessed Vodafone's launch of Qatar's first

Roboy, a next-generation robot, which offers new and very different insights into human-robotic interaction and even the functioning of the human skeleton



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virtual store, and a record-breaking speed demo of 4.1 Gbps over TDD-FDD LTE by Nokia Networks, Ooredoo Qatar and China Mobile, enabling mobile users to download a full-length 5 GB high-definition movie in 11 seconds, while uploading a 5-minute 30 MB video clip in under a second.

DAY TWO — 8 December 2014

At the session on **Affordable international backhaul,** there was broad agreement on policy frameworks to promote ICTs, including support for local IXPs, promotion of demand, and market liberalization. Participants emphasized the importance of getting a balance of technologies, leveraging submarine cable, terrestrial fibre, satellite, and access technologies from Wi-Fi to WiMAX, drones to balloons, in a mix that makes sense in each individual market. Open access is likely to differ in each country, depending on market structure. Open access must extend across broadband value chains to include data centres, servers and transport.

The session on **Broadband roll-out in emerging economies** saw participants debating universal access and it was underlined how broadband can underpin vibrant local economies and combat rural-urban migration. In Indonesia, a proportion of telco revenue is paid as spectrum fees into a universal service fund; however, the fund's rules are rigorous and few funds have been paid out. Participants emphasized that governments should not see telco revenues as an easy target.

The session, **"A regulator's nightmare",** emphasized that regulation must strike a balance between rules and flexibility. At the session, **"A call to arms for regulators",** it was agreed that regulation must be enabling, not controlling, and focused on best practice in a local context. One panellist urged regulators to work differently, considering the public institutions and users of ICT services rather than focusing on operators and suppliers. Regional regulation is complex — for example, there is no single view among 23 European regulatory authorities on how market consolidation should be addressed. As the Internet of Things (IoT) develops, policymakers must allow the private sector to experiment before establishing any regulatory framework, or risk closing down viable solutions. The panel agreed on the need for "collaboration, balance, and working across the entire ecosystem".

The session on **Networks in the cloud** emphasized the many different touch points of cloud and telcos, from software defined networking (SDN), network virtualization, cloud platforms for enterprises, software developers and API platforms, with different types of intersection between the network and the cloud. It is vital for operators and regulators to distinguish between the different types and their implications to avoid confusion. The incoming Director of the ITU Standardization Sector (ITU–T), Chaesub Lee, was optimistic that "the market and standards will work out, as they have done for decades — one might be ahead of the other at different points, but players are investing, and the interoperability needed for public networks will follow". Who owns data, and who keeps it secure? Security mechanisms are present in each layer, but panellists expressed concerns that the cloud is not yet secure overall.

At the session on **Convergence of broadcasting and broadband,** participants debated differences between broadcasting at once to many (for example, for major events where a big peak in traffic is expected at a fixed time) versus broadband for events where fewer people may watch at any given moment. The session on the **Digital dividend** underlined the role of broadcasting as a uniter of people versus the Internet, and it was suggested that it would be a mistake to predict that broadcasting will eventually be displaced. According to Ericsson, there will be 50 billion connected devices by 2020, of which 15 billion will be connected via video. Content-on-demand will become the norm, changing consumer behaviour. The market for mobile broadband is very competitive, but it is unclear that revenues will increase in line with traffic.

The session on **Financing the networks of the future** heard how data consumption is exploding, driven by smartphone penetration of over 1500 devices per square kilometre in the world's 400 biggest cities. The IoT could multiply traffic by a factor of thirty by 2017, while cloud could result in a 440% increase over the same period. Massive network investments are

needed to cope with demand in wireless, wireline or backhaul networks. However, this need for investment comes at a time of decreasing revenues, bandwidth-hungry Over-The-Top (OTT) players and outdated data connection agreements, leaving the industry reluctant to invest in network upgrades. What can be done? One possible answer is passive infrastructure sharing. The panel agreed that ensuring the sustainability of the whole ICT ecosystem calls for new innovative solutions and new ways of solving the connectivity dilemma in times of disruption. Broadband is the destination, although there are different routes to this same destination.

DAY THREE — 9 December 2014

In a session on **Cross-sector partnerships,** ITU Secretary-General Houlin Zhao (Deputy Secretary-General at the time of the Telecom event), reminded participants that "collaboration has always been of great importance to growth in any endeavour or industry — nowhere is that more true than in the ICT sector". He concluded with a clear commitment that "I will do my best to strengthen cooperation between industry and ITU". ITU Telecom World 2014 convenes stakeholders from government, industry, manufacturers, and app developers to explore how parties can work together to satisfy customers and sustain business. Discussions focused on changing roles for telcos in a converged landscape — should telcos compete or cooperate with new players? There is an opportunity for telcos to become trusted custodians of data from multiple silos. The session on **Telco innovation** opened with a quote from Bill Gates:

ITU Telecom World 2014 showfloor

"Banking is important; banks are not" — can the same be said of telcos? Historically, innovation for telcos has often not come from telcos. Operators often talk about innovation mainly for B2C, when the most dynamic area may in fact be enterprise B2B.

With regard to the **IT-ization of telecom networks,** panellists described how networks are becoming all-IP, while functions virtualized and network topology become more distributed. Mini-clouds cache content and host key functions. Network Functions Virtualization (NFV) and Software-Defined Networking (SDN) are game-changers, although the main players within network virtualization are still tier one United States and European operators. SDN gives customers the opportunity to have their own network worldwide. Operators have a "sense of urgency" in adopting this to respond to competition and network problems — the question is not if, but when.

The session on **Big Data for development** described how vast amounts of data traffic are generated by consumers each day (the equivalent of 360 000 DVDs every minute), which is often viewed as a liability. Big data analytics can show what has happened in the past — i.e. in monitoring migrations and/or epidemics. Further research may reveal why, or predict what can happen in the future. Large amounts of data are already in the public domain, from government censuses surveying ethnicity and religion to detailed household surveys and rich social media. The session on **Community-driven partnerships** described how corporate social responsibility (CSR) projects are empowering societies.

The session on **"Scarce resource or shared resource?"** saw mobile and satellite representatives stake their claims to the hotly-contested C-band, and debate whether sharing is a viable option. The panel concluded that sharing in some format is likely to happen, and it is down to national administrations to decide how, when and which spectrum sharing can take place. Each region or nation has its own very specific context, market and requirements in this regard.

Makame Mbarawa, Tanzania's Minister of Communications, Science and Technology, related how the National ICT Broadband Backbone has enabled Tanzania to become a regional ICT hub, with 7560 km of fibre optic cable laid to neighbouring countries. Tanzania has nearly completed the digital transition, with only three cities left to migrate, and is poised to become one of Africa's first fully digital countries. President and CEO of Ideas Africa, Lolia Emakpore launched the aSMART Summit, supported by the Commonwealth Telecommunications Organisation (CTO), the West Africa Telecommunication Regulators Assembly (WATRA) and Nigeria's National Information Technology Development Agency (NITDA), and invited attendees of ITU Telecom World to get involved with aSMART.

The high-profile **SMART Africa initiative** was represented by four participating countries — Rwanda, Kenya, Uganda and South Sudan. Rwanda's Minister of Youth and ICT, Jean Philbert Nsengimana, hopes it will position Africa as a global leader in the ICT space: "Africa missed the economic revolution and the industrial revolution," he said, "but it will not miss the knowledge revolution". Uganda's Minister of Information and Communications Technology, John Nasasira, focused on making Internet access affordable to all African citizens and explained that sacrifices must be made in terms of public sector revenue to achieve affordability.

Day three also saw the launch of the **Global Cybersecurity Index 2014,** jointly prepared by ITU and the consulting firm ABI Research. The United States took top position, with Canada coming in a close second. Three countries shared third place — Oman, Australia and Malaysia — while New Zealand and Norway ranked fourth. Brazil, Estonia, Germany, India, Japan, the Republic of Korea and the United Kingdom were joint fifth. Several countries were highlighted for their commitment to cybersecurity, including Turkey and Rwanda.

DAY FOUR — 10 December 2014

The final day saw closing debates on the Internet of Things (IoT). Will IoT prove a nirvana of connectivity, or will the dream be derailed by issues of privacy and security? In the debate on our **Intelligent Future,** François Rancy, Director of the ITU Radiocommunication Bureau, emphasized that IoT is not new — it is the scale of connectivity that is changing, underpinned by mobile networks and spectrum.

According to some estimates, IoT could be worth USD 19 trillion between 2013 and 2023. Machine-to-machine (M2M) communication devices have overtaken smartphones as the fastest-growing category of network with IP addresses, with 221 billion connected devices projected by 2018. IoT has huge implications for chips, sensors and IT cloud connectivity. However, panellists identified gaps in reality versus expectations, and the pace of industry versus that of regulatory bodies. One panellist suggested we have not yet come very far towards IoT.

The panel debated whether the best approach lies in combining ICT regulators with national and international bodies overseeing other industries, or in appointing a sole data regulator to govern the use and regulation of data. Panellists agreed that there is little danger of companies developing devices within the ecosystem crossing over to become operators: the telecommunication industry is heavily regulated.

The next debate questioned whether **IoT will be a panacea or fuel paranoia.** Some players are greeting IoT warmly. Others are more cautious, believing that its appeal depends on what is done with that information generated by IoT. The session began with the panel's thoughts on IoT, and naturally, migrated to issues around security and privacy. On the upside, IoT enables energy suppliers to install smart meters on cell sites to monitor consumption and reduce carbon emissions. Indeed, IoT has already been around for a long time, while many people may not even know they have been using it.

However, when many devices communicate, security and privacy issues become a cause for concern. Security is a major issue when all kinds of data can be represented in the cloud. Global regulation on data privacy can prove difficult, as there are so many differences between countries' regulatory frameworks — and telcos have to adhere to local policies. One panellist compared IoT with Pandora's Box — there are frequent catastrophic security breaches, with the industry and technology playing catch up.

People may have a right to privacy; however, privacy is a cultural construct, which is difficult to define for regulatory

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Young Innovators Programme

purposes. Consumers often voluntarily give up privacy to improve their lives (such as the app, Life360) or in exchange for discounts. Regulations often lag behind innovation, which is accelerating. Overall, the session concluded that IoT is likely to prove a "force for good", but we must remain careful as to how it is used, as it could rapidly be used in inappropriate ways. Finally, panellists emphasized that IoT is here to stay, so we had better learn to live with it!

Another session focused on Vanuatu's experience in rolling out ICTs to its population, where Fred Samuel, Chief Information Officer of the Government of Vanuatu, gave an interesting and informative overview. Vanuatu has a population of 255 000 across a number of islands sometimes prone to natural disasters. Challenges include a low literacy rate, multiple languages, and lack of access to electricity. However, its climate, beaches, activities and friendly population present opportunities for tourism. Vanuatu's ICT markets opened up in 2008, helping to increase mobile cellular penetration from 16% in 2008 to 50% in 2013, with over 90% of the population covered by a mobile signal. Mobile broadband penetration is at 9%, but measures are in place to increase this with a submarine cable starting service in 2014 and a national ICT policy focusing on cybersecurity and universal access.

Innovation

The future of innovation was showcased at the event in the Lab and by winners of the Young Innovators competition. Social entrepreneurs between ages 18–30 from around the world highlighted innovative digital solutions with positive social impact.

In addition to the humanoid robot Roboy, further examples of innovation in action could be seen in the Lab on the show floor, including: MineKafon, a wind-powered mine detector; Perpetual Plastic Project, an interactive recycling installation that transforms plastic into new products through 3D printing; Parametric Hybrid Wall, a responsive surface able to re-model its own shape; and Bhoreal, an open source interface that can be used to control all types of hardware and software.

You can find further insights and perspectives in our Executive Interviews on the ITU Telecom World 2014 YouTube playlist. Our Outcomes report, featuring an in-depth analysis of all the debates at the event will be released in March. For more information, including all the session highlights, visit http://telecomworld.itu.int/.

Leader Interview with Denis O'Brien

Founder and Chairman of Digicel Group

Interviewed by Reza Jafari, Chairman and CEO of e-Development International

Reza — It is my great pleasure to introduce Denis O'Brien — it's great to have you here. Denis, you are Founder and Chairman of Digicel, one of the most successful emerging markets telecom operators, and you have been a very influential leader in both business and social projects. Please tell us about Digicel and your portfolio.

Denis — We started operations in 2001 in Jamaica — at that time, it cost about 2 USD per minute for a long-distance phone call. Only very wealthy people could make calls, and we've changed that. Today, there is 110% mobile penetration in Jamaica, and the country now has a better telecommunication network than most parts of the United States. And we are now doing the same in Papua New Guinea — bringing the most modern technologies including 4G and LTE to a developing country. I believe broadband is a human right, and I hope this will be spelt out in the United Nations Sustainable Development Goals (SDGs) in 2015. If you want economic development in the developing world, you have to put in place umbilical cords (such as submarine terrestrial fibre optic networks), in order to drive development.

Reza — You own a broadcasting organization, a hospital and an online recruitment company in China. Do you feel that ecosystems make a significant contribution to development?

Denis — We need to build a broadband ecosystem in the developing world quickly. Today, around 2.5 billion people worldwide have access to broadband, but nearly all of those people are living in developed countries. The biggest challenge now is that broadband access is still less than 10% in many developing countries. It will need huge amounts of network investment to increase penetration levels of broadband penetration to reach European or United States levels, and I would question

the business case. The e-health plans we are talking about are heavily dependent on mobile operators. Generally, right now in developing countries in Africa, around 25% of operators' revenues are re-invested in capital expenditure (capex) in infrastructure, over which the OTT players and content providers generally have a free ride. In my view, the telecom operators are on their own — there needs to be a contribution from over-the-top (OTT) content and applications providers — such as Google, Facebook, WhatsApp and Skype — which are offering services over telecommunication networks and gaining revenue, without contributing to the costs of the new networks.

In my view, net neutrality is great for those living in the United States, but not for those living in Africa — it means that Silicon Valley can ride across the networks in other countries free of charge, without making much financial contribution. The United States Federal Communication Commission got 4–5 million hits on its website in a couple of days following the recent interventions on net neutrality. This issue was significant in the mid-term elections at the start of November, and will be significant in the presidential elections in the countdown to 2016.

Reza — So the main point is that the broadband ecosystem needs to be sustainable — operators cannot build the infrastructure and let others come and "have a party in your house"?

Denis — It is a balancing act. The regulators in Africa, Asia, South America and the Caribbean all say they want everyone to have access to broadband. Once people have broadband access, they are able to gain access to all the other services. In Burkina Faso, it is unrealistic to project that 90% of the territory will ever be covered by Long Term Evolution (LTE) or 4G broadband networks. Satellite access could be a good alternative solution and is not very expensive.

In Africa, one million health workers are needed just to stand still. Professor Jeffrey Sachs (Director of the Earth Institute at Columbia University, United States, and Special Adviser to United Nations Secretary-General Ban Ki-moon) is playing a key role in this.

We said we would do something to support health workers with connectivity in Haiti. The telecom operators should give the capacity free of charge. You are only looking at modest connectivity — costing around 10 Euro per month. This is not a cash purchase, and would not affect cash flow, where the capacity already exists. It is rather like an airline seat that goes empty from New York to Dublin — network capacity is perishable daily. It is up to the telecom operators to be responsible citizens and provide these modest capacity requirements to Jeffrey Sachs for free.

I think Haiti has made great progress. In a way, the tragic earthquake has actually helped move the country on. There are lots of different organizations including non-governmental organizations (NGOs) on the ground now, such as Mercy Corps, Concern Worldwide, and Partners in Health — the most important thing in a country like Haiti is working through the government ministries. There is a core group of NGOs — Haiti now has a functioning health service. The biggest issue is jobs — 35% of people do not have a job. Haiti is heavily dependent on Venezuela, which gives Haiti oil supplies at a preferential rate. The government budget in 2014 was 3 billion USD for a country with over ten million people. The key challenge is attracting foreign direct investment (FDI) into Haiti. How do you get manufacturing jobs into Haiti? Digicel, directly and indirectly, employs 35 000 people. When we put a new staff training course up on our internal website, there is tremendous interest — everyone signs up. There is a real hunger for personal advancement. One person earning a salary is likely to be looking after 10–15 family members. Haiti now has a really good Government — they have a President and a Prime Minister who really want to improve the standard of living of ordinary people and move the country forward.

Reza — Can we take the lessons learned in Haiti and apply these lessons to Africa for public-private partnerships (PPPs)? And what is the role of government to incentivize you?

Denis — There is a practice among some emerging market governments about selling spectrum and new licenses for vast amounts of money. Governments and regulators see telecom operators as profitable businesses. There was a recent spectrum auction in Nigeria for a considerable amount of money — money that is taken out of the industry in spectrum fees. In Ireland, we sold spectrum licenses for 300 million Euros in a developed country. For developing countries, I don't think there should be any charge. I think it is much better to impose contractual obligations on operators to roll out the networks quickly, and if operators fail to deliver, then by all means, penalize the operators for not fulfilling the contractual obligations they signed up to.

Reza — It has been a great opportunity to talk with you, thank you very much.

Denis — Thank you. And just to mention in closing, I was just reading the profiles of all the different organizations represented here. It is the power of the 200 people in this room, not their organizations, that matters.

This interview originally took place at the GETHealth Summit in Dublin, Ireland. ITU News gratefully acknowledges the kind permission of Denis O'Brien to reproduce excerpts from the interview.

The great telco conundrum

Contributed by Chris Lewis of Lewis Insight Consulting

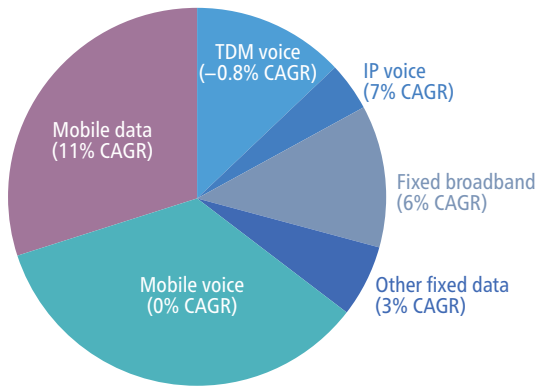
Death of the cash cow?

This article summarizes the key takeaways from "The Great Telco Debate" workshop, held in London on 7 November 2014, and attended by a range of telecom and IT experts and consultants. Discussions focused on how "telcos" will evolve in the future, and the key factors driving the industry. Telecommunications and connectivity are fast becoming the basis for the delivery of many different types of services, while driving massive disruption in how the market delivers services — for example, Skype is disintermediating voice, while Netflix is disintermediating Sky. The global telecom market is currently estimated at a total of USD 1.67 trillion (the breakdown of which is shown in Figure 1), growing at 1–2% overall per year, driven mainly by expansion in China and emerging markets.

However, all is not rosy in telecommunications. Revenues for fixed-line and mobile operators are falling in Europe, largely due to regulation and competition. Average revenue per user (ARPU) is falling across the board (including in China) due to discounting, with some headline statistics suggesting that the telecommunication sector was set to lose USD 14 billion revenue in 2014 due to competition from over-the-top (OTT) players such as WhatsApp and Skype. Traffic volumes are sky-rocketing: according to Diametric Analysis, around 1.3 billion people watch online video worldwide per month, and 450 million people watch online video every day on average, and capital expenditure (capex) bills are increasing. Keith Willetts (co-founder and Chairman of the Board of Directors of the TeleManagement Forum) and Tony Poulos (Editor of Disruptive Views) suggested in their presentation that, although rates of return on aggregate investment are still positive overall, returns on new investment may be negative. This is creating a conundrum for the industry to address, which is especially severe for incumbent telcos and mobile operators (cable operators and "altnets" still enjoying a positive relationship between revenue and investment, for the time being). Ernst & Young have stated that "failing to shift business models is the biggest risk currently facing telcos".

The broadband ecosystem now comprises very different types of players competing to offer the same — or similar — services. Market capitalizations vary widely for these different types of players (see Figure 2). Market valuations for OTTs are only loosely connected to revenues (see left chart, Figure 2) and operative profit (see right chart, Figure 2), reflecting a shift in value from telcos to digital content providers and OTT players within the telecommunication value chain. Telcos have traditionally been valued

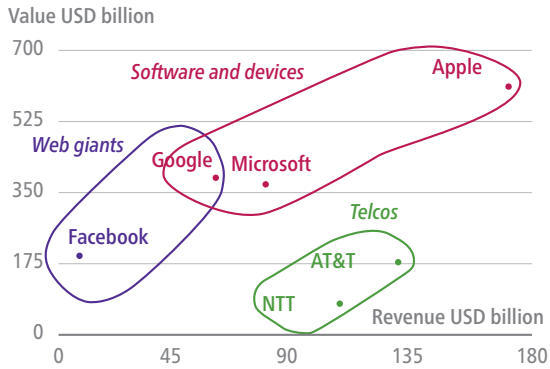
1 *Global telecommunication market, 2013*
Total USD 1.67 trillion



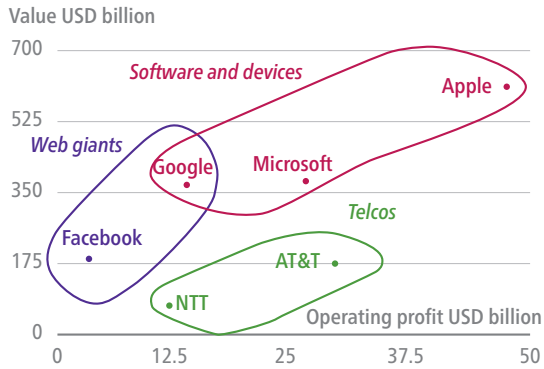
CAGR: Compound annual growth rate
TDM: Time division multiplexing
IP: Internet Protocol

Source: IDC Worldwide Telecommunication Services Database, 2013.

2 *Market capitalizations for different players in the broadband ecosystem*



Source: BWCS.



Source: BWCS.

at 6 x EBITDA and 12 x earnings and generally paid dividends of around 5%. In contrast, social networks are evaluated at 12 x revenues. Keith Willetts pointed out that telcos are still stuck in the *you-buy–you-pay* model of business. In contrast, OTT players have decoupled who buys from who pays through their indirect business models and partnering. According to Philip Carse, Lead ICT Analyst for Megabuyte.com, the Internet revolution is now happening, but this is not reflected in telco valuations — the last time valuations became so detached from earnings or revenues was just before the dot.com boom!

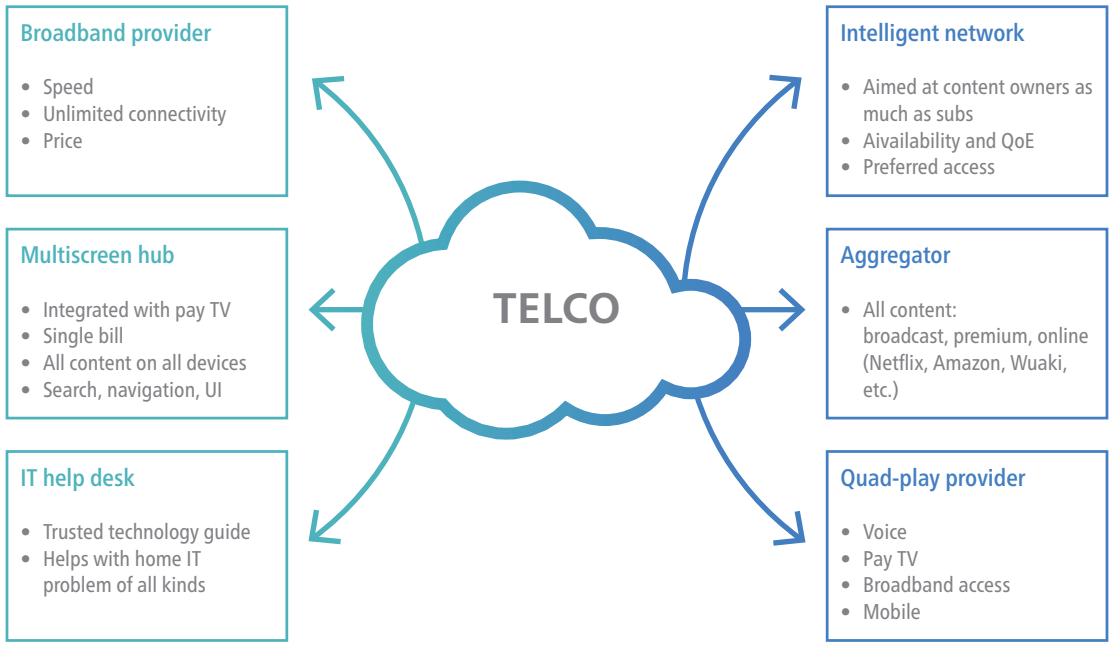
For consumers, video (including audio streaming, as well as listening to music via YouTube) represents a major driver of both customer demand and high traffic levels. However, video comes from its own ecosystem, with its own value and supply chain, including the sharing of video over social networks — which telcos are struggling to control, let alone, exploit.

Some telecommunication players are increasingly moving into content delivery to defend their broadband revenue streams. EE described the launch of their EETV service over their very successful 4G network. EE's business model is based mainly on meeting consumers' desire to multiscreen within their own homes, as well as on improving customer loyalty and reducing churn. Customers now engage in parallel dispersed viewing on demand — consumers now *timeshift* (usually previous day) while interacting over a range of devices via Facebook, Twitter and Google. Youngsters consume content today in a fundamentally different way from older generations — people now consume content in bites, not buckets (i.e. by individual music songs, not by albums). And in future, according to a quote by Ben Verwaayen, former CEO of Alcatel-Lucent, consumers may not even buy services, they will buy transactions.

Telcos — Evolving roles and competencies

Various roles were suggested for telcos throughout the day (see Figure 3). Graham Wilde, co-founder and CEO of BWCS, noted that telcos' core competencies have evolved from managing a (copper) pipe to a wraparound of expansion services, including television (TV). One third of BT's revenues now derive from IT services, bringing BT into competition with players such as IBM. Chris Lewis, Telecommunications Industry Analyst at Lewis Insight, suggested that telcos can extend into new services and build converged infrastructure, but they need to stay focused on customers. Telcos need to develop different core competencies that include: maintaining

3 *Possible roles for telcos*



Source: Diametric Analysis.

their network; marketing and managing their brand with customers; and keeping up with technological change.

Participants agreed that telcos need to defend their broadband services. According to Philip Carse, telcos have little option but to invest in next-generation networks (NGNs) — if they don't, their competitors will. Some can aim to provide a platform for a multi-screen, multi-device hub, (the strategy being followed by EE). Telcos can also engage in becoming business bundlers and aggregating content, i.e. by pulling together multiple providers into a single package as with pay TV services. Pim Bilderbeek, Partner and Principal Analyst at METISfiles, noted that it is unclear as to whether telcos will become brokers or exchangers of services. Telcos should also explore new market segments — Teresa Cottam, founder and Chief Strategist of Telesperience, noted that there is a large business opportunity of around 20 million small and medium-sized enterprises (SMEs) in Europe. However, SMEs' needs are varied, so a "menu" of more personalized services is required rather than any single specific service, including functions of an IT help desk. Network function virtualization (NFV) could significantly reduce capex and operational expenditure (opex), as it is cheaper to buy software than rack-and-stack hardware.

Telcos need to be flexible around other peoples' business models and allow customers to choose with whom they want to do business, and scale the organization accordingly. New business models and new attitudes to partners and channels are needed, along with regulatory frameworks to drive investment and innovation. There is still a lot of potential for agile providers of service and technology into the telecommunication sector. Ultimately, telcos should follow the money — try to anticipate where future revenues lie, and use today's revenues to follow tomorrow's money.

WTIS 2014: Indicators symposium recognizes progress in ICT development

The 12th World Telecommunication/ICT Indicators Symposium (WTIS), organized by ITU and hosted by the Government of Georgia, took place in Tbilisi, Georgia, 24–26 November 2014 to debate hot topics related to international information and communication technology (ICT) statistics and information society measurement. The three-day Symposium, the main global forum to discuss ICT statistics, was attended by 250 participants from 79 Member States and 15 other public and private organizations.

The Symposium was opened by Irakli Garibashvili, the Prime Minister of Georgia, in the presence of Giorgi Kvirikashvili, the Minister of Economy and Sustainable Development and Vice-Prime Minister of Georgia, and Dimitry Kumsishvili, First Deputy Minister of Economy and Sustainable Development, and Chair of WTIS 2014. In his opening remarks, Mr Garibashvili highlighted the vital importance of telecommunications as a priority sector for Georgia's development, and described the liberalization of its market, the move to digital broadcasting, and the introduction of e-government services.

ITU was represented by the Secretary-General Elect, Houlin Zhao (now ITU Secretary-General), who highlighted the important role of WTIS at the dawn of the post 2015-development period, when ICTs are expected to play a critical role for the sustainable development of countries. He further emphasized the importance of ITU's work in monitoring the information society. Brahima Sanou, Director of the ITU Telecommunication Development Bureau, described the framework for ITU's work on ICT statistics emanating from the ITU Plenipotentiary Conference 2014 and sixth World Telecommunication Development Conference.

WTIS began with a ministerial round table in which participants discussed the upcoming post-2015 development agenda and future ICT4D policies. The keynote speaker, Professor Richard Heeks of the United Kingdom's University of Manchester, highlighted the mismatch between new development priorities and current ICT4D priorities and emphasized the importance of "development through ICTs", where economic, social and political life is digitally mediated. The experiences of Jordan, Namibia and Egypt were also presented, and panellists emphasized how data can form a sound basis for economic and social policy and decision-making. Calls were made for the Partnership on Measuring ICT for Development, ITU and National Statistical Offices (NSOs) to contribute actively to data collection.

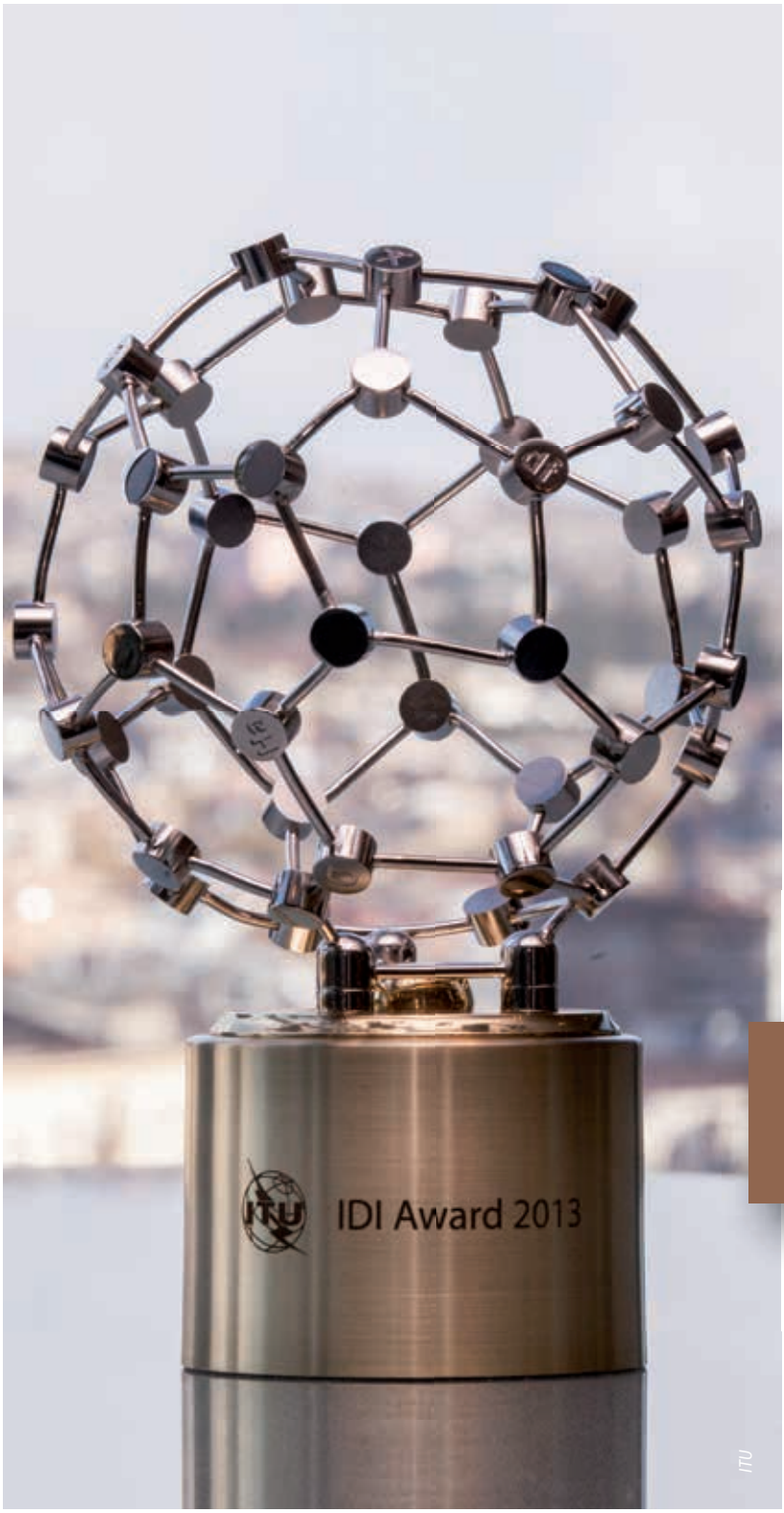
Discussions took place on "big data", which offers huge possibilities for complementing existing and producing new ICT indicators, including from: mobile devices, mobile apps, mobile payment platforms, content delivery networks, social media, instant messaging, and other Internet sources. Despite challenges with regard to data quality, methodologies and privacy, mobile and Internet data are already being used to produce real-time information, including for tracking and monitoring the impact of earthquakes and epidemics. However, analysis of big data suggests that the geographical distribution of Internet content may not match the distribution of Internet users, and highlights the uneven geography of knowledge production.

Another session focused on measuring competition, regulation and affordability of ICT services. Experts also discussed data quality, open data policies, and the progress of the work carried out by the Partnership on Measuring ICT for Development. Participants debated current and future work on telecommunication/ICT indicators and ICT household indicators, and received reports from the Expert Group on Telecommunication/ICT Indicators (EGTI) and the Expert Group on ICT Household Indicators (EGH) on their work over the past year. Hong Kong (China) and Spain presented their experiences with household surveys, while the experiences of Japan and Moldova were presented with regard to implementing open data policies.

With a view to improving international comparability, it was agreed that a revision of the indicator on International Internet bandwidth was necessary, and participants discussed the difference between the indicators on mobile phone owners, mobile phone users and mobile-cellular subscriptions. ITU will collaborate with GSMA Intelligence to improve global data on mobile phone uptake and usage.

A special session on the international coordination of ICT measurement was held at the occasion of the 10th Anniversary of the Partnership on Measuring ICT for Development.

ITU's flagship statistics publication, "Measuring the Information Society Report 2014", was launched at WTIS. The ICT Development Index (IDI) country rankings were announced at an award ceremony, and discussed during a separate panel. Denmark ranked first in ITU's IDI, a composite measurement that ranks 166 countries according to their level of ICT access, use and skills (see separate article about the report and ICT Development Index). An "Information society measurement award" and trophy were awarded to those countries that had hosted world telecommunication/ICT indicators events; Egypt (WTIM 2009), Mauritius (WTIM 2011), Thailand (WTIM 2012) and Mexico (WTIS 2013), as well as Georgia. The Government of Japan offered to host WTIS 2015.



For further information, including the agenda, the presentation slides, webcast archives, documents and the list of participants, please see: www.itu.int/en/ITU-D/Statistics/Pages/events/wtis2014/default.aspx.

Listen to the views of some of the speakers:

- Dr Azzam Sleit, Minister of Information and Communications Technology, Jordan
- Stanley Simataa, Deputy Minister of Information and Communication Technology, Namibia
- Nagwa Ebrahim Elshenawy, Under-Secretary for Information and Strategic Planning, Ministry of Communications and Information Technology, Egypt
- Kiyoshi Mori, Director General for International Affairs, Global ICT Strategy Bureau, Ministry of Internal Affairs and Communications, Japan.

WTIS 2015 will take place in Japan within the week of 30 November to 4 December 2015.

Measuring the Information Society Report 2014

The latest edition of ITU's annual flagship publication "Measuring the Information Society Report 2014" paints a picture of ongoing growth in mobile-cellular telephony, mobile broadband and Internet usage. Meanwhile, demand is shifting from fixed to mobile telephony, and from fixed to mobile broadband in the developing world. Although the information society continues to expand, digital divides still persist — and are even widening — in some segments. There exists especially a significant urban-rural digital divide.

The 2014 annual report was presented at a special launch session during the World Telecommunication/ICT Indicators Symposium (WTIS) in Tbilisi, Georgia, on 24 November 2014, attended by Houlin Zhao, now ITU Secretary-General, and Brahima Sanou, Director of the ITU Telecommunication Development Bureau, alongside representatives from governments, statisticians, industry experts and the United Nations family. Several WTIS sessions were dedicated to discussing the key findings of the report and the results of the ITU ICT Development Index (IDI).

Key findings 2014

- *Nearly 300 million additional people came online worldwide in 2014.*
- *Denmark tops the information and communication technology (ICT) ranking, closely followed by the Republic of Korea.*
- *By the end of 2014, there were around seven billion mobile subscriptions, roughly corresponding to the total global population. However, many users have multiple subscriptions, so universal mobile connectivity is far from being achieved.*
- *Indeed, global ICT growth sometimes translates into little real improvement in connectivity for those at the very bottom of the pyramid — some 450 million people still live without mobile coverage, let alone the purchasing power to enable them to use mobile telephony. Global mobile-cellular population coverage has reached 93%.*
- *Over 40% of the world's population now uses the Internet, amounting to nearly 3 billion people worldwide. Of the 4.3 billion people who are not yet connected, 90% live in the developing world. In developed countries, more than three out of every four people are online, compared with one out of every three in the developing world.*
- *Growth in the number of Internet users has been matched by an explosion in online content — most notably, Google searches (see Chart 1.16 in the report), Facebook accounts (see Chart 1.17 in the report), YouTube videos, and Wikipedia articles (see Chart 1.18 in the report).*
- *Levels of capital investment by operators have still not returned to their peak level in 2008 for both world and developed countries. The good news is that telecommunication investment in developing countries has exceeded 2008 levels.*

ICT Development Index country rankings

ITU's latest ICT Development Index (IDI) ranks 166 countries according to eleven indicators measuring their level of ICT access, use and skills, including mobile cellular subscriptions, households with a computer, Internet users, fixed and mobile broadband Internet subscriptions, and basic literacy rates. The IDI is a valuable benchmarking tool to track the digital divide.

The index shows that Denmark leads the world in terms of ICT development, followed by the Republic of Korea (which had led the index for the previous three years in a row). Sweden, Iceland, the United Kingdom. Norway, the Netherlands, Finland, Hong Kong (China) and Luxembourg also rank in the top 10 (see table). The United Arab Emirates, Fiji, Cape Verde, Thailand, Oman, Qatar, Belarus, Bosnia and Herzegovina, and Georgia are the most dynamic countries, with above-average improvements in their IDI rank over the past year.

All economies in the IDI top 30 are high-income economies, underlining the strong link between income and ICT progress. The report notes that these countries have highly liberalized and competitive ICT markets that are at the forefront of innovation, as well as trained workforces with the skills to make use of information and communication technologies.

ICTs and the MDGs

The report also includes extensive analysis of how ICT development (as represented by the IDI) relates to the United Nations Millennium Development Goals (MDGs). New data shows significant correlation between the IDI and nine of the MDG indicators, notably those related to poverty reduction and health improvement. This indicates that there is also an important correlation between ICT development and other indicators of development in developing countries. "The report finds that progress in ICT development is linked to progress in achieving some of the MDGs. It is precisely in poor and rural areas where ICTs can make a particularly significant impact. ITU has long been a vigorous champion of ICTs as a cornerstone of socio-economic development," said Brahima Sanou, Director of the ITU Telecommunication Development Bureau, which produces the report.

ICT Development Index (IDI), 2012 and 2013

The IDI includes eleven indicators grouped into access, use and skills sub-indices.

Economy	Rank 2013	IDI 2013	Rank 2012	IDI 2012
Denmark	1	8.86	2	8.78
Korea (Rep.)	2	8.85	1	8.81
Sweden	3	8.67	3	8.68
Iceland	4	8.64	4	8.58
United Kingdom	5	8.50	7	8.28
Norway	6	8.39	6	8.35
Netherlands	7	8.38	5	8.36
Finland	8	8.31	8	8.27
Hong Kong, China	9	8.28	11	8.08
Luxembourg	10	8.26	9	8.19
Japan	11	8.22	10	8.15
Australia	12	8.18	12	8.03
Switzerland	13	8.11	13	7.94
United States	14	8.02	14	7.90
Monaco	15	7.93	17	7.72
Singapore	16	7.90	15	7.85
Germany	17	7.90	18	7.72
France	18	7.87	16	7.73
New Zealand	19	7.82	19	7.62
Andorra	20	7.73	24	7.41
Estonia	21	7.68	21	7.54
Macao, China	22	7.66	20	7.59
Canada	23	7.62	25	7.37
Austria	24	7.62	23	7.46
Belgium	25	7.57	26	7.33
Ireland	26	7.57	22	7.48
Bahrain	27	7.40	28	7.22
Spain	28	7.38	29	7.14
Israel	29	7.29	27	7.25
Malta	30	7.25	30	7.08
Slovenia	31	7.13	31	6.96
United Arab Emirates	32	7.03	46	6.27
Latvia	33	7.03	33	6.84
Qatar	34	7.01	42	6.46
Barbados	35	6.95	32	6.87
Italy	36	6.94	36	6.66
Croatia	37	6.90	34	6.70
Belarus	38	6.89	43	6.45
Greece	39	6.85	35	6.70
Lithuania	40	6.74	40	6.50
Czech Republic	41	6.72	38	6.57
Russian Federation	42	6.70	41	6.48
Portugal	43	6.67	39	6.57
Poland	44	6.60	37	6.63
Slovakia	45	6.58	45	6.30
Hungary	46	6.52	44	6.35
Saudi Arabia	47	6.36	50	6.01
Uruguay	48	6.32	51	5.92
Bulgaria	49	6.31	47	6.12
Serbia	50	6.24	49	6.07
Cyprus	51	6.11	48	6.09
Oman	52	6.10	61	5.43
Kazakhstan	53	6.08	53	5.80
St. Kitts and Nevis	54	6.01	52	5.89
Costa Rica	55	5.92	55	5.64
Chile	56	5.92	54	5.68
Antigua & Barbuda	57	5.89	59	5.49
Romania	58	5.83	58	5.52
Argentina	59	5.80	56	5.58
TFYR Macedonia	60	5.77	62	5.42
Moldova	61	5.72	60	5.44
Lebanon	62	5.71	64	5.32
Montenegro	63	5.67	57	5.52
Azerbaijan	64	5.65	65	5.22
Brazil	65	5.50	67	5.16
Brunei Darussalam	66	5.43	63	5.36
Trinidad & Tobago	67	5.29	70	4.99
Turkey	68	5.29	68	5.12
Bosnia and Herzegovina	69	5.23	74	4.89
Mauritius	70	5.22	72	4.96
Malaysia	71	5.20	66	5.18
St. Vincent and the Gren.	72	5.17	69	5.04
Ukraine	73	5.15	71	4.97
Armenia	74	5.08	73	4.89
Seychelles	75	4.97	76	4.70
Grenada	76	4.96	75	4.83
Colombia	77	4.95	80	4.61
Georgia	78	4.86	83	4.48
St. Lucia	79	4.81	79	4.66
Venezuela	80	4.81	78	4.68
Thailand	81	4.76	91	4.09
Panama	82	4.75	77	4.69
Dominica	83	4.72	81	4.58
Albania	84	4.72	85	4.42
Maldives	85	4.71	82	4.50
China	86	4.64	86	4.39
Jordan	87	4.62	84	4.48
Ecuador	88	4.56	88	4.28
Egypt	89	4.45	87	4.28
South Africa	90	4.42	89	4.19
Fiji	91	4.40	103	3.90
Mongolia	92	4.32	90	4.19
Cape Verde	93	4.30	104	3.86
Iran (I.R.)	94	4.29	97	4.02
Mexico	95	4.29	94	4.07
Morocco	96	4.27	92	4.09
Jamaica	97	4.26	98	4.01
Suriname	98	4.26	93	4.08
Tunisia	99	4.23	96	4.07
Palestine	100	4.16	95	4.07
Viet Nam	101	4.09	99	3.94
Dominican Rep.	102	4.06	105	3.78
Philippines	103	4.02	102	3.91
Botswana	104	4.01	100	3.94
Peru	105	4.00	101	3.92
Indonesia	106	3.83	106	3.70
Bolivia	107	3.78	109	3.52
Kyrgyzstan	108	3.78	107	3.69
Paraguay	109	3.71	108	3.56
El Salvador	110	3.61	110	3.47
Guyana	111	3.48	111	3.44
Syria	112	3.46	112	3.39
Ghana	113	3.46	115	3.29
Algeria	114	3.42	114	3.30
Uzbekistan	115	3.40	116	3.27
Sri Lanka	116	3.36	113	3.31
Namibia	117	3.24	118	3.08
Guatemala	118	3.20	117	3.11
Honduras	119	3.18	119	3.01
Nicaragua	120	2.96	120	2.78
Zimbabwe	121	2.89	123	2.68
Sudan	122	2.88	121	2.69
Bhutan	123	2.85	126	2.58
Kenya	124	2.79	124	2.62
Cuba	125	2.77	122	2.69
Gabon	126	2.66	125	2.61
Cambodia	127	2.61	127	2.54
Swaziland	128	2.60	128	2.43
India	129	2.53	129	2.42
Senegal	130	2.46	133	2.20
Nepal	131	2.37	134	2.20
Lesotho	132	2.36	131	2.22
Nigeria	133	2.35	135	2.14
Lao P.D.R.	134	2.35	130	2.25
Gambia	135	2.31	136	2.12
Solomon Islands	136	2.29	132	2.22
Congo (Rep.)	137	2.24	137	2.09
Yemen	138	2.18	138	2.07
Angola	139	2.17	139	2.06
Cameroon	140	2.10	142	1.98
Djibouti	141	2.08	140	2.01
Pakistan	142	2.05	141	2.01
Mali	143	2.04	147	1.86
Zambia	144	2.02	143	1.97
Bangladesh	145	1.97	146	1.90
Uganda	146	1.94	144	1.90
Mauritania	147	1.91	145	1.90
Rwanda	148	1.86	151	1.74
Benin	149	1.84	149	1.75
Myanmar	150	1.82	148	1.75
Côte d'Ivoire	151	1.80	150	1.74
Tanzania	152	1.76	152	1.72
Liberia	153	1.70	154	1.57
Guinea-Bissau	154	1.67	153	1.60
Afghanistan	155	1.67	155	1.57
Burkina Faso	156	1.56	160	1.35
Congo (Dem. Rep.)	157	1.56	157	1.47
Malawi	158	1.52	156	1.50
Mozambique	159	1.52	159	1.40
Madagascar	160	1.42	158	1.43
Guinea	161	1.42	161	1.31
Ethiopia	162	1.31	162	1.24
Eritrea	163	1.20	163	1.18
Chad	164	1.11	164	1.09
Niger	165	1.03	165	0.97
Central African Rep.	166	0.96	166	0.93

Source: ITU.

ICT prices and the role of competition

The price of ICT services is a key determining factor in their uptake, and affordability (the level of prices relative to income) remains a major barrier. The good news is that where prices are being monitored over time, they are gradually decreasing — for example, entry-level broadband plans are becoming more affordable, and fell from an average price of 94.5% of GNI per capita in 2008 to 18.3% of GNI per capita worldwide in 2013. Advertised speeds for fixed-broadband plans are increasing: 1 Mbit/s was the most common entry-level speed in 2013, compared with 256 kbit/s in 2008.

It is widely believed that competition acts to reduce prices, but is this causal, or have price declines in mobile and fixed-broadband over the last five years just happened to coincide with the rise of competition? This is not necessarily causal — the introduction of new broadband technologies could be driving price reductions, rather than changes in market structure.

The report analysed trends in broadband prices for more than 144 countries and related the changes in prices to economic development (as measured by GNI per capita), urban population, level of competition in the market, regulatory frameworks (as measured by the ITU Regulatory Tracker), the presence of a data plan cap and speed. All of these variables were significant in determining price, except speed. The move from a duopoly to a triopoly (assuming equal market share) is associated with average prices 5.8% lower for fixed broadband and 7.8% lower for mobile cellular. The results of the analysis suggest that if fixed-broadband markets in developing countries were to achieve the competition levels of developed countries, entry-level fixed-broadband prices could fall by as much as 10% in the developing world, and mobile-cellular prices by 5%.

Regulation also plays a determining role in shaping prices, particularly in fixed-broadband services. The report suggests that if international regulatory best practices were adopted, fixed-broadband prices could be reduced by as much as 9.7% in developing countries. The results of a comprehensive price data collection for four different types of mobile-broadband service shows that mobile broadband is cheaper than fixed broadband in many countries. Mobile broadband in developed countries is six times more affordable than in developing countries. Austria has the world's most affordable mobile broadband, while Gambia, Niger and Vanuatu have the least affordable. Many European countries, Qatar, Hong Kong (China) and Macau (China) also rank well for affordable mobile broadband packages.

Income inequality is one reason why fixed and mobile broadband remain unaffordable for large segments of the population in developing countries. A large proportion of households in the developing world cannot afford to have one handset-based mobile-broadband plan per person, and often a subscription is shared among members of the same household.

Big data for ICT monitoring and development

The report also explores the role of big data and its significance for ICT monitoring and for development, including data produced by telecommunication operators. In today's hyperconnected world, people, objects and devices leave digital footprints in many forms, as well as ever-increasing data flows from transactions and interactions, messages and/or traces from the Internet of Things (IoT). The term "big data" usually refers to datasets whose volume, velocity or variety is very high compared to the kinds of datasets that have been traditionally used. The emergence of big data also reflects advances in technology that make it possible to capture, store and process increasing amounts of data from different data sources.

Data from mobile operators are available in real-time and at low-cost, and are being used, for example, to track mobility patterns and to map poverty levels.

The report explores ways of using big data from the ICT industry to monitor the information society, including mobile subscription and traffic data, and customer profiling to reveal new insights into ICT uptake and use, and the digital divide. A number of WTIS-14 panels and sessions discussed the topic of big data.

For more information, see: www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2014.aspx.

ITU

ITU celebrates 150 years

On 17 May 1865, the International Telegraph Convention was signed, marking the commitment of ITU's founding members to work together to connect the world. Ever since this first meeting almost 150 years ago, ITU's membership has risen to face the challenges of the rapidly evolving telecommunication/information and communication technology (ICT) sector, by "innovating together".

"The story of ITU is one of international cooperation — among governments, private companies and other stakeholders. Our continuing mission is to achieve the best practical solutions for integrating new technologies as they develop, and to spread their benefits to all," said outgoing ITU Secretary General, Dr Hamadoun I. Touré, on 21 October 2014, at the ITU 150th Anniversary launch event during the ITU Plenipotentiary Conference (PP-14), held in Busan, Republic of Korea.

A variety of celebratory events are planned throughout 2015 to commemorate the major milestone of 150 years of ITU history.

A rich and varied history

Since 1865, ITU has grown to 193 Member States and over 700 Sector Members, with academia being granted membership in 2011. ITU has a rich history of multilateral public-private partnership. ITU's mandate has continually expanded to meet the needs of the growing telecommunication/ICT sector — which has seen landmark events such as the invention of voice telephony, the launch of the first communications satellites, and most recently, the arrival of the information age and the

spread of its associated benefits across the globe.

ITU's collaborative work on currently emerging technologies such as the Internet of Things (IoT), next-generation networks and smart cities is vital as "smart" technologies have become increasingly adopted in sectors ranging from health to security. As Mohamed Al Ghanim, Director General of the Telecommunications Regulatory Authority (TRA), United Arab Emirates, said at the 150th Anniversary launch event, "Today, every Member State plays an important role in pursuing the development process for this organization, keeping up with the accelerated rate of constant ICT breakthroughs and innovations."

A year of celebrations

This year of anniversary celebrations will be an opportunity to highlight the history of ICTs as well as achievements of ITU and its members over the past 150 years.

The festivities began in January, with ITU welcoming the new leadership team — Houlin Zhao, Secretary-General; Malcolm Johnson, Deputy Secretary-General; François Rancy, Director of the Radiocommunication Bureau (BR); Brahima Sanou, Director of the Telecommunication Development Bureau (BDT); and Chaesub Lee, Director of the Telecommunication Standardization Bureau (TSB). In January, they participated in online debates, discussing their vision for the future of the Union. This also encompassed the Connect 2020 Agenda, the international community's shared global vision for the development of the telecommunication/ICT sector adopted during the 2014 Plenipotentiary Conference. This agenda comprises four high-level strategic goals — growth, inclusiveness, sustainability, innovation and partnership — and 17 measurable targets to be achieved by 2020, as described in the Plenipotentiary Resolution entitled, "Connect 2020 Agenda for global telecommunication/information and communication technology development" (see article in ITU News No. 6, 2014).

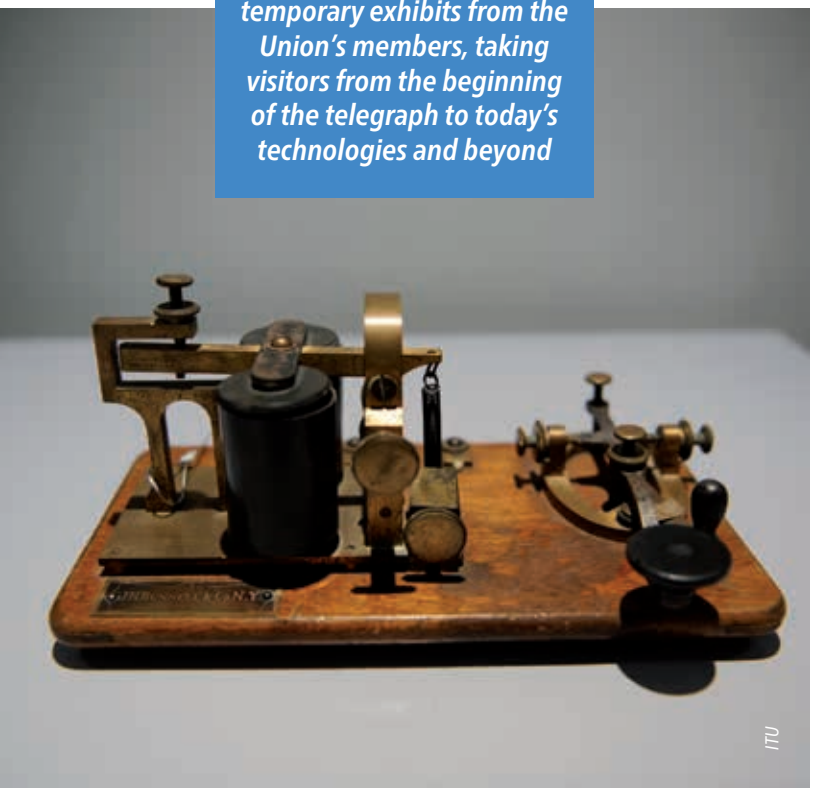
The year 2015 also marks the launch in September of the United Nations Post-2015 Development Agenda. Due to their far-reaching application in sectors such as education, employment and health, among others, ICTs are integral to achieving the renewed sustainable development goals. ITU will also launch promotional activities around the high-profile World Economic Forum Annual Meeting in Davos-Klosters, Switzerland, in January, under the theme, "Innovative Investment in Future Broadband Networks".

From February to December, monthly themes (see table) highlight ITU's commitment to "innovating together". The thematic calendar includes events that are strategically defined by ITU's areas of action and core competencies — from accessibility, radiocommunications and the digital switchover to gender issues — showcasing the extensive reach of ITU's work.

Events to be held throughout the year range from video features about the future networked car to webinars with youth on the future of radio. The different activities will also be captured on social media — Join ITU by following our channels and be part of the conversation.

Calendar of thematic months	
January	ICT's Drivers of Innovation
February	Youth and Innovation
March	Innovation and Intelligent Transport Systems
April	Girls and Women and Innovation
May	ICT's Drivers of Innovation
June	Digital Switchover and Innovation
July	Accessibility and Innovation
August	Bridging the Digital Divide
September	Navigation and Innovation
October	Big Data and Innovation
November	World Radiocommunication Conference (WRC) as Enabler of Innovation
December	ITU — Driver of Future Innovation

ICT Discovery will showcase temporary exhibits from the Union's members, taking visitors from the beginning of the telegraph to today's technologies and beyond



On 17 May, World Telecommunication and Information Society Day (WTISD), ITU will host its key 150th Anniversary event in Geneva, Switzerland, with the theme, "Telecommunication/ICTs: Drivers of innovation". A range of activities will take place throughout the day, including a live feed from national celebrations. The ITU150 Awards winners will also be announced to honour individuals from government, the ICT industry, academia and civil society that have contributed to improving lives of world citizens through ICT innovations developed, promoted or implemented by ITU. Nominations can be submitted before the 15 March by ITU Members via http://www.itu.int/en/150/Pages/awards.aspx (ITU Members only). The anniversary day activities will be followed by a gala dinner offered by Switzerland to celebrate the founding day of ITU.

International celebrations

A number of national celebrations will take place throughout 2015 and so far, more than 50 activities have been planned by various organizations worldwide to celebrate ITU's 150th birthday. They will span the globe and mirror the reach of ITU's work and capabilities. Commitments range from commemorative stamps, exhibitions, conferences, webinars and e-learning platforms.

The ITU's 150th Anniversary celebrations truly mark a major historic milestone. Houlin Zhao, now ITU Secretary-General, highlighted this at PP-14, observing, "Over the last 150 years, ITU has demonstrated its ability to lead telecommunications and ICT development in the world". Noting the continued and dedicated support from ITU's members, he is confident that ITU and its members will continue to work together to provide even better telecommunications and information and communication technologies, to ensure a better life for all.

ITU looks forward to welcoming you to one of the 150th celebratory events. Or why not join in and organize your own activities within your country or region? Information can be found on the 150th Anniversary website at: www.itu150.org.

Contributions from the following partners are supporting various global activities related to ITU's 150th Anniversary

Gold Partners

MINISTRY OF COMMUNICATIONS AND HIGH TECHNOLOGIES OF THE REPUBLIC OF AZERBAIJAN

The Republic of Azerbaijan

المملكة العربية السعودية

Kingdom of Saudi Arabia

هيئة تنظيم الاتصالات TRA
TELECOMMUNICATIONS REGULATORY AUTHORITY

United Arab Emirates

Silver Partners

RÉPUBLIQUE DE CÔTE D'IVOIRE
Union - Discipline - Travail

Côte d'Ivoire (Republic of)

Republic of Ghana

ZIMBABWE

Republic of Zimbabwe

Bronze Partners

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RÉPUBLIQUE CENTRAFRICAINE

Central African Republic

НРТБ

HUAWEI

inmarsat

NTT Group

ROHDE&SCHWARZ

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AFP

Combating counterfeit and substandard ICT devices

An ITU event on *Combating counterfeit and substandard ICT devices* was held at ITU Headquarters, in Geneva, Switzerland, on 17–18 November 2014. It was chaired by Dr Eugene Juwah, Executive Vice-Chairman/CEO of the Nigerian Communications Commission (NCC), who noted that the strong attendance and interest in the event underline the importance of collective action to curtail counterfeit and substandard information and communication technology (ICT) devices.

Counterfeiting is increasingly becoming a problem within the ICT industry, partly driven by growth, especially in mobile. Counterfeit and substandard ICT devices can have a significant negative impact on industry in lost income, dilution of trademark value and lower consumer trust and governments, i.e. in terms of lost revenues, customs duties and taxes, while presenting serious health hazards, privacy and security concerns, low performance and degraded quality of service to consumers. According to presentations at the event, there is clearly a need to gather, analyse and disseminate more facts and empirical data about the nature and impact of counterfeit and substandard products — not only to

gain a better understanding of the scope of the problem, but also to enable the crafting of adequate solutions to redress it.

In his keynote speech, Dr Robert Kahn, Chairman, CEO and President of the Corporation for National Research Initiatives (CNRI), described ITU–T Recommendation X.1255, entitled "Framework for discovery of identity management information", as a conceptual framework with direct relevance to combat counterfeit goods. He introduced Digital Object Architecture (DOA) and the work of the DONA Foundation on unique persistent identifiers. In his opening address, Brahima Sanou, Director of the ITU Telecommunication Development Bureau, highlighted the adoption of World Telecommunication Development Conference (WTDC) Resolution 79 on the role of telecommunications/ICTs in combating and dealing with counterfeit telecommunication devices (these include counterfeit and/or copied devices and equipment as well as accessories and components). A new Resolution adopted at the ITU Plenipotentiary Conference on combating counterfeit ICT devices, has also introduced this issue into ITU's work.

The policy debate

In the Policy Debate session, governments offered their perspectives on combating counterfeit and substandard ICT products. The Ukrainian State Centre of Radio Frequencies described how Ukraine introduced its Automatic Information System for Mobile Terminal Registration (AISMTRU) in 2009 to protect the national market from imports of counterfeit and substandard mobile phones. The National Communications Authority (NCA) of Ghana noted that counterfeit phones cost very little, and have actually contributed to increasing teledensity in the country, while creating youth employment. However, they pose a number of challenges in terms of health, safety, e-waste, quality of service, interference, and tax evasion. In March 2014, the Ghanaian regulator issued IMEIXS a licence to implement the GSMA International Mobile Equipment Identity (IMEI) platform with a serial number unique to every device, in order to block counterfeit mobile phones. However, the licence does not make it mandatory for mobile network operators to connect to this platform.

The Telecommunications Regulatory Authority (TRA) of the United Arab Emirates presented the United Arab Emirates plan to minimize counterfeit products in the country. In September 2011, TRA issued the Directive on "Duplicative IMEI" and is conducting an awareness campaign among consumers, as many believe that counterfeit ICT devices perform as well as genuine ICT devices. By 2012, TRA had disconnected more than 100 000 handsets. ANATEL presented Brazil's SIGA Project to control cloned devices. Regulations in Brazil dictate that operators can allow only authorized devices onto networks, but ANATEL believes that a considerable proportion of the terminals on the network today are currently unauthorized. ANATEL is working with all stakeholders including GSMA, operators and manufacturers to increase the success of its SIGA Project to control counterfeit and substandard ICT devices. The UK's Department for Business, Innovation and Skills (BIS) described how the number of counterfeit devices is increasing in tug-of-war between manufacturers and counterfeiters. It was agreed that all stakeholders should work together to address this issue, while respecting the privacy of end-users, and that multilateral action and better awareness are needed.

According to participants, initiatives in other countries to combat counterfeit ICT devices include:

- Azerbaijan — A database for IMEI codes has been in operation under the Ministry of Communications and High Technologies since 2013.
- Colombia — The Ministry of Information and Communication Technologies has two IMEI code databases, one for lost and stolen mobile devices and the other for those devices that are legally manufactured and imported.
- Egypt — The National Telecommunications Regulatory Authority (NTRA) set up a Central Equipment Identity Register (CEIR) in 2010 and has found 500 000 mobile handsets with fake IMEI codes.
- India — In 2009, the Government of India banned services on mobile handsets without IMEI numbers; up to

25 million mobile handsets are estimated to have become ineffective.

- Kenya — 1.89 million counterfeit mobile phones have been phased out since 2012, following notice by the Communications Authority of Kenya that all mobile network operators disconnect these devices from their networks.
- Sri Lanka — The Telecommunications Regulatory Commission of Sri Lanka is looking to develop and implement a National Equipment Identity Register (NEIR) that allows all mobile operators to be connected to IMEI databases and share blacklisted mobiles.
- Turkey — The Information and Communication Technology Authority of Turkey established a Central Equipment Identity Registry. By the end of 2010, some 14 million handsets had been blacklisted with cloned IMEI.
- Uganda — the Uganda Communications Commission (UCC) has launched a project which aims to gradually eliminate counterfeit phones.

Governments are pursuing anti-counterfeit programmes and establishing databases for a range of different reasons, although protecting tax revenues is a common goal.

Intergovernmental initiatives

During the session on Intergovernmental Initiatives, the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO), the European Commission (EC), the Organisation for Economic Cooperation and Development (OECD) and the World Customs Organization (WCO) presented initiatives to protect intellectual property rights (IPRs) and combat counterfeit and substandard products. Participants agreed on the need for clear and correct use of terminology, neatly summarized by WTO as follows:

- counterfeit equipment is related to the infringement of trademarks with intent to deceive and defraud consumers;
- infringement of trademarks may confuse consumers, but lacks malicious intent to deceive;
- contraband equipment is a trade issue and relates to the infringement of customs regulations; and
- substandard equipment is a regulatory issue. Substandard products may

A man stands in front of a shop window displaying mobile phones on 1 October 2012 in Nairobi, as Kenya confirmed a switch-off of counterfeit mobiles at the end of that month. The mobile networks were forbidden from activating new "fake" devices bought after 1 October. Government officials said the move was designed to protect consumers from hazardous materials and to safeguard mobile payment systems and prevent crime. (Source: AFP)

be non-compliant, but they may have a national trademark, so they are not necessarily counterfeit.

These terms are different from one another and should not be used interchangeably, as the term used partly shapes the response. WIPO pointed out, for example, that the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) can help fight counterfeit ICT goods, but not substandard ICT goods, as this is a regulatory issue not related to IPRs. Article 61 of TRIPS gives guidance on what constitutes counterfeit goods, and creates obligations on WTO Member States to make criminal penalties available — selling fake or counterfeit goods is illegal in most WTO Member States.

The European Commission (EC) highlighted that, within the ICT industry, mobile phones are clearly the largest source of concern when it comes to counterfeiting and substandard practices. Nevertheless, counterfeit and substandard ICT accessories, chips and other components also now infiltrate the supply chain of many other industries, including aviation, construction, and health. According to the EC, the ex-post application of regulation to seek redress does not work alone; a preventative approach is needed to tackle the problem of counterfeiting and substandard ICT devices at source.

Measurement of counterfeit and pirated trade is difficult due to very limited data availability. The methodology of the OECD is based on data for tangible products that infringe trademarks based on surveys from customs authorities, which are extrapolated through WCO data. Further research and data are needed about the real nature and impact of counterfeit goods because the assumptions, for example, that counterfeit ICT devices are necessarily of poor quality and are dangerous for health need to be backed by solid empirical data. For its part, WCO pointed out that, of approximately 1.1 billion counterfeit products stopped by customs authorities in Africa as part of Operation Biyela, 40% of these were electronic appliances.

The technology debate

The Technology Debate was hosted in two sessions. Industry perspectives were presented in the fight against counterfeit and substandard ICT products. The Mobile Manufacturers Forum (MMF) cited research related to negative network performance arising from counterfeit phones. Counterfeit phones drop one in four calls, delay handover, and fail in every third handover. Operators can tackle and reduce the number of counterfeit phones operating on their networks in order to increase quality of service. GSMA described its International Mobile Equipment Identifier (IMEI) database to uniquely identify mobile phones. Over 700 operators, 14 national regulatory and law enforcement agencies, and two customs agencies have used the database to recover devices and prevent device laundering.

Cisco Systems presented its cradle-to-the-grave approach to security throughout the Machine-to-Machine (M2M) supply chain. Security must be taken into account from the very beginning in designing products through quality control, logistics, supply of solutions to end-of-life disposal — security cannot be bolted on later. Microsoft has a group of almost one hundred professionals working on counterfeiting, piracy, malware disruption and IP protection. Microsoft considers that its experience of malware and counterfeit devices is analogous to its past experience with software — first, counterfeiters make cheap replicas, sell them and make money; then, counterfeiters also aim to access users' data and control devices. Microsoft sees existing legal frameworks as sufficient, but they need to be better utilized.

Hewlett Packard presented its Global Anti-Counterfeit (ACF) Programme, and pointed out that the issue of counterfeiting is not only limited to ICT and printing equipment. Rather, the problem also extends to ICT components and accessories such as laptops, adapters, batteries, servers, hard drives, and USB flash drives. *Société Générale de Surveillance* (SGS) emphasized the need to verify, survey and enforce. If counterfeit or substandard ICT goods are blocked at customs, experience shows that they may nevertheless filter into the country via other channels. Better coordination is needed between different agencies.

The Ministry of Industry and Information Technology of China explained how China has introduced the handle system and Digital Object Architecture (DOA). Today, six large firms are using this system

Shutterstock

to combat counterfeiting in the food industry. By late 2014, 80 million handles were already in use in China. The International Federation of Pharmaceutical Manufacturers & Associations (IFPMA) described issues in relation to counterfeit medicines and pharmaceutical goods. At least 10% of all medicine is fake, while in developing economies, 10–30% of drugs are counterfeit. Track and Trace systems can help increase control throughout the supply chain, but the cost of their implementation is high. Discussions highlighted that counterfeiting is growing, despite best efforts to combat it. However, a cost versus benefits approach is needed — it is possible to track, trace and tag many products, but the costs could exceed the benefits. The counterfeiting problem affects stakeholders differently — for example, telecommunication operators may not be very concerned about counterfeit goods, as long as counterfeit handsets or chips do not affect network performance or traffic.

Within the ICT industry, mobile phones are clearly the largest focus for counterfeiters, but chips and other ICT components are now found in other industries. E-commerce is a boon to counterfeiters — criminals are adept at cross borders and moving around to avoid restrictions and tax. Regulation applied to redress the problem does not work alone — a preventative approach is needed to tackle this problem at its source.

Participants agreed that:

1. An inclusive approach is needed involving regulators, governments, consumers, civil society and the industry.
2. There is a need to gather, analyse and disseminate more data about the nature and impact of counterfeit and substandard products, and the role of ICTs in combating them.
3. Preventative approaches are needed to reduce incentives throughout the supply chain; a better and more efficient use of existing technical solutions, such as international standards, could contribute to this.
4. A reinforced policy, legal regulatory framework is needed across sectors, emphasizing enforcement.
5. Raising awareness, capacity-building and consumer education are vital for all stakeholders.

ITU can play a role in implementing activities and assisting its Member States under each of these five action areas. In his closing remarks, Malcolm Johnson, the then Director of the ITU Telecommunication Standardization Bureau, and now ITU Deputy Secretary-General, thanked everyone for their interest, and noted ITU's willingness to collaborate with all stakeholders. ITU will examine how it can implement some of these proposals, based on the mandate from the ITU World Telecommunication Development Conference (WTDC-14) and the ITU Plenipotentiary Conference (PP-14).

For more information and final report, see the event webpage at: www.itu.int/en/ITU-T/C-I/Pages/WSHP_counterfeit.aspx. Also learn how to spot a fake phone at: www.spotafakephone.com/.

Participants at the Special Session of the ITU/UNESCO Broadband Commission for Digital Development at the World Economic Forum's 2015 Annual Meeting. From left to right: Richard Samans, Member of the World Economic Forum's Managing Board; Dr Ali Abbasov, Minister of Communications and High Technologies, Azerbaijan; Toomas Hendrik Ilves, President of Estonia; Paul Kagame, President of the Republic of Rwanda; and Houlin Zhao, ITU Secretary-General

Special Session of the Broadband Commission in Davos

The effective use of broadband networks, services and applications is providing transformative solutions to address the key challenges of our times, including reducing poverty and malnutrition, improving health care or decoupling economic growth from the use and depletion of natural resources. To achieve these ambitious goals, broadband and information and communication technologies must reach all people, in particular those facing social exclusion, living in remote locations or facing the greatest exposure to environmental hazards and economic deprivation.

However, financing and deploying broadband to reach low-income communities or people in remote areas is proving challenging, due to a combination of factors that make these markets less attractive for private investors. This means that either governments often have to provide the sole source of funding, or take steps to attract investment or co-investment, so as to expand access to broadband to the least advantaged groups. For these purposes, the cooperation and buy-in of a range of agents in the information and communication technology (ICT) ecosystem is imperative.

This Special Session of the ITU/UNESCO Broadband Commission for Digital Development at the World Economic Forum's 2015 Annual Meeting (21–24 January) in Davos-Klosters, Switzerland, sought to identify actions and policies that will encourage that cooperation and attract finance and investment in broadband. In particular, stakeholders from industry, government and financial institutions were invited to present and discuss the following action areas:

- Gaining access to low-cost private sector finance;
- Introducing effective policy and regulation for the ICT sector;
- Devising appropriate tax policies for the sector;
- Selecting and implementing other interventions to underpin the necessary investment.

Participants agreed that spurring the finance and investment for the future roll-out of broadband is critical, if we are to unleash the power of broadband to deliver transformative solutions to the development goals of our day. A number of speakers noted that broadband is transforming almost every act of production and consumption, whether public or private, including the delivery of vital services with public value such as education, health and cultural services. A number of participants highlighted the gap between growing demand and traffic volumes and reduced incentives for operators to invest. Current public-private investment models may not be sufficient; innovative new financing mechanisms are needed. Participants agreed that appropriate steps are needed to encourage investment in broadband networks, as well as specific interventions with a positive impact in broadband investment.

With regard to whether regulation can keep pace with fast-moving technological change, the latest research by ITU and the ITU/UNESCO Broadband Commission for Digital Development suggests that the regulation of broadband networks and content is highly asymmetric between different types of players. Technological convergence is blurring the boundaries between services and industries. Regulators and policy-makers are seeking to adapt and update regulatory requirements, with the introduction of "fourth-generation" regulation to establish an enabling environment to encourage sustainable investment.

Participants agreed that a level regulatory playing-field might help encourage investment in broadband networks; however, few were entirely certain what a "level playing-field" would really look like, and between which sets of players. All participants were united, however, in agreeing that the stakes are high, and digital exclusion is too great a risk, so both traditional and evolving players must work together for the benefit of industry and society as a whole.

GEM-TECH Award winner: Spotlight on UNESCO


AFP

ITU celebrated the Gender Equality and Mainstreaming Technology (GEM-TECH) Awards 2014 in Busan, Republic of Korea, on 28 October at a Plenary Session of the ITU Plenipotentiary Conference. In this and future editions, ITU News will feature the chosen winner and project for each category, beginning with Category 1.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) won the first category of the seven GEM-TECH Awards, *"ICT Applications, Content, Production Capacities and Skills for Women's Social, Political Empowerment and Women's Empowerment Linkages with Sustainable Development"* with its online portal, Women in African History: An E-Learning Tool (Africa). This platform consists of multimedia educational resources highlighting the role of women in African history (including comic strips, audio modules, and quizzes). Ensuring meaningful engagement of young girls with information and communication technologies (ICTs) through the production of relevant local content, the e-learning tool enables capacity building of young girls as both decision-makers and producers in the information and communication technology sector. The platform is currently available in English and French (http://fr.unesco.org/womeninafrica/), with several African languages to be rolled out by 2015 to promote multilingualism in cyberspace and encourage online access by rural populations.

UNESCO is known as the "intellectual" agency of the United Nations and its main objective is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication in order to further universal respect for justice and the rule of law and for human rights and fundamental freedoms for the peoples of the world.

Gender equality is one of UNESCO's global priorities and the organization strives to promote gender equality and women's empowerment by integrating these principles into all its work programmes. Education makes it possible to transmit the essential value of gender equality, and can help reinforce the fundamental human rights of women and their central role in all societies. The teaching of history has a crucial role to play since it enables the understanding of cultural dimensions, and highlights the social, political, and economic conditions in the lives of women in past societies.

Through the use of ICTs, the platform showcases African women or women of African descent. It demonstrates that historically, women have distinguished themselves in the history of the continent in areas as diverse as politics (Gisele Rabesahala), diplomacy and resistance against colonization (Nzinga Mbandi), defence of women's rights (Funmilayo Ransome-Kuti) and environmental protection (Wangari Maathai). In terms of Open Educational Resources (OERs), the portal highlights the work of Yaa Asantewaa, Angie Elizabeth Brooks, Bessie Coleman, Awa Kaita, Miriam Makeba, Queen Nanny, Nehanda Nyakasikana, Huda Shaarawi, and Sojourner Truth.

By emphasizing the education, academic careers and main achievements of these exceptional women, UNESCO highlights their legacy and calls for continued research on the role of women in African history.

See our article on the GEM-TECH Awards 2014 in ITU News No. 6 (November/December 2014). Over the coming months, ITU News will be featuring more GEM-TECH winners.

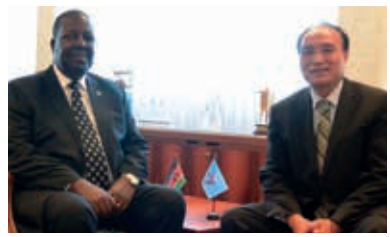
Official Visits

During January 2015, courtesy visits were made to ITU Secretary-General Houlin Zhao by the following ministers, ambassadors to the United Nations Office and other international organizations in Geneva, and other important guests.

Houlin Zhao, ITU Secretary-General and
Jean Jipguep, Former Deputy-Secretary General of ITU

Anayansi Rodríguez Camejo,
Ambassador of Cuba

Maurizio Enrico Serra,
Ambassador of Italy



Dr John Otachi Kakonge,
Ambassador of Kenya

Obaid Salem Saeed Al Zaabi,
Ambassador of the United Arab Emirates

Amr Ahmed Ramadan,
Ambassador of Egypt

Joachim Rücker, Ambassador of Germany (centre) and Gönke Roscher, Head of the Economic Division at the Permanent Mission of Germany, Geneva, Switzerland (right)

All photos are by ITU.

Professor Tim Unwin,
Secretary General of the Commonwealth Telecommunications Organisation

Peter Sørensen,
Head of the EU Delegation to the United Nations in Geneva, Switzerland

Arto Räty,
Permanent Secretary of the Ministry of Defence, Finland

Pascal Clivaz,
Deputy Director General of the Universal Postal Union's International Bureau

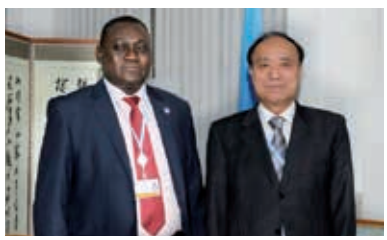
Rolf-Dieter Heuer,
Director General of the European Organization for Nuclear Research (CERN)

Mohamed Siad Doualeh,
Ambassador of Djibouti

Charles Chew,
Director, International, Infocomm Development Authority of Singapore (IDA)

Faisal Bin Hassan Trad,
Ambassador of Saudi Arabia

Päivi Kairamo,
Ambassador of Finland



Richard Anago,
Director of Cooperation and International Organizations, National Office of Telecommunications, Burkina Faso

Fusanobu Yonago,
Director for Technology Cooperation, International Policy Division, Global ICT Strategy Bureau, Ministry of Internal Affairs and Communications, Japan

Ambassador Benedicto Fonseca Filho,
Director, Department of Scientific and Technological Affairs, Ministry of External Relations, Brazil

ITU 150th Anniversary

Calendar of monthly themes

January

ICTs Drivers of Innovation

February

Youth & Innovation

March

Innovation & Intelligent Transport Systems

April

Girls & Women & Innovation

May

ICTs Drivers of Innovation

June

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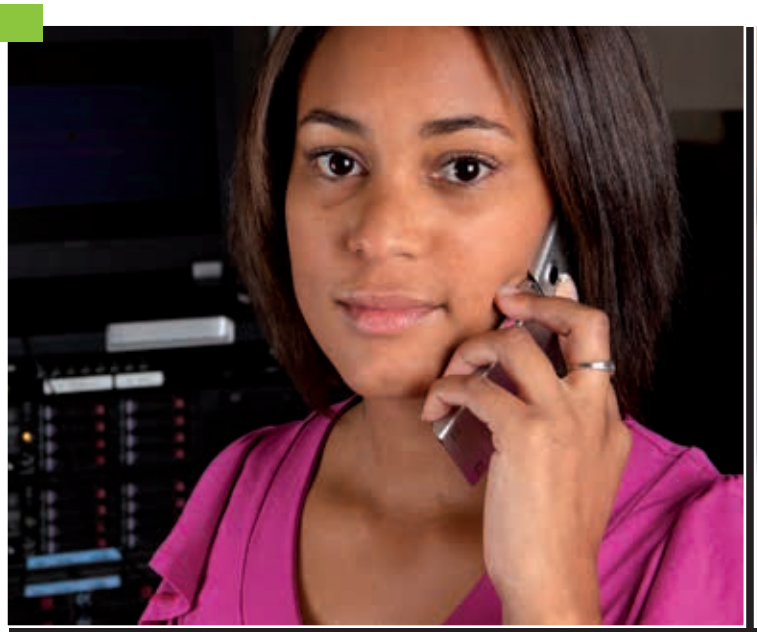

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