



conversation that matters

Outcomes Report: An Industry in Transformation

# Foreword

By Dr. Hamadoun I. Touré, ITU Secretary-General

It is my great pleasure to introduce this Outcomes Report, the result of in-depth analysis of more than 55 Forum sessions, keynote speeches, roundtables and workshops held at ITU Telecom World 2012 in Dubai last October. The exclusive Leadership Summit, interactive panel sessions, ministerial roundtables, industry workshops, Big Conversations and Visionary Keynote speeches brought together the best of international ICT leadership from public and private sectors, from academia, non-governmental organizations and consultancies, to discuss the implications of the current radical transformation of our industry.

Conversations continued on the showfloor amongst national and thematic pavilions and industry stands showcasing innovative products, solutions and investment opportunities from around the world - as well as at the Innovator Space, where the twelve young finalists of the second Young Innovators Competition demonstrated their winning ICT-based solutions to developmental challenges.

In the course of discussions, there was diversity of opinion, consensus and contradiction - but above all, passionate

engagement in the issues that matter. The new realities of the ICT industry - and of society - cannot be ignored or wished away. There is no way back to a pre-digital age: demand for data is growing exponentially as traditional voice loses value and relevance; over-the-top services and players are increasingly successful; next-generation networks such as LTE and software-defined networks will shape the future; open source development is booming as emerging markets, local entrepreneurs and consumers across the globe are empowered.

The principal message emerging from these five days of debate in Dubai was that the industry must embrace rather than resist the change, adapt, reposition and engage with new services, markets, partners and consumers.

It is a powerful and positive message from a vibrant and rapidly changing industry sector. We hope that you can enjoy and benefit from the key findings from ITU Telecom World 2012 here - and look forward to continuing the debate both online and in person throughout the year and in Bangkok, at ITU Telecom World 2013.



# Introduction

By Dr. Stuart Sharrock, Event Curator



The ideas, arguments, and recommendations presented here are a consolidation of many hours of debate amongst some of the finest minds concerned with the issues driving the ICT industry today. ITU TelecomWorld 2012 produced disruption and digression, commonplaces, radical new directions, but also much consensus. This report does not aim to be comprehensive, but serves both as a wrap-up of the event, an introduction to the topics discussed there, and an invitation to continue the debate at ITU TelecomWorld 2013.

Certain themes run across all the topics and sessions: the irreversible nature of the transformation brought about by IP-based services, the loss of old models and certainties, the urgent need to embrace change and respond quickly and imaginatively to new opportunities.

The ICT sector is undergoing a process of fragmentation. The consumer, consumer needs and consumer-driven innovation are increasingly at the centre of communications ecosystems. The emphasis is on local services, local content, local development grounded in the community needs of local markets. Differentiated models and applications must evolve to fit the specificities of geography, demography, generation, and economic and social environment. Splitting infrastructure and services, offering tiered access based

on individual requirements, personalizing networks and tailoring packages for particular organizations or sectors- this is the fragmentation at the root of a rich range of potential business models and markets.

There is a simultaneous move towards consolidation. Vertical sectors from broadcasting to government services and health are forcing new convergence models as the benefits of technological developments such as cloud applications, M2M and virtualized networks take hold. The way forward is often through sometimes surprising partnerships within the industry, with government and with other sectors. Information, research, revenue and networks must be shared to maximise value and benefit for all. Cooperation is essential to drive cybersecurity, e-Health and broadband at scale; collaboration is at the heart of open source development and innovation; only by engaging and working together can the trust frameworks be created that will mitigate privacy concerns and allow data to flow.

We are often exhorted to think big, aim for the stars, be bold in our visions. But it may well be that a series of smaller, less dramatic, more pragmatic actions are better suited for current times. The micro-management of process, the establishment and dissemination of

best practice, the discipline of impact assessment: these unglamorous activities can support vision and produce results in areas such as cyberhygiene, opening up rights of way for broadband deployment, targeting customer needs from the bottom up rather than top down, focusing on quality in the core competency of the network.

Keeping the balance is, perhaps, the single most important thread running through these pages. Balanced regulation allows competition and innovation whilst protecting both end-users and intellectual property; expectations of privacy and confidentiality must be balanced against the benefits and convenience of free data flow; respect for human rights and the open internet are balanced by security concerns; and governments are called upon to balance universal provision of broadband against actual demand, short-term gains of spectrum auctions against long-term industry growth, free competition against the effectiveness of managed oligopolies.

**With these themes of balance, cooperation and diversity in mind, we welcome your thoughts, differing opinions and contributions to the ideas in this document. Contact us online, by email, over LinkedIn, Twitter or Facebook.**

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# Features of the New Landscape

The rapid growth of IP services, the success of over-the-top (OTT) players in providing services, content and applications, and the explosion of data, cloud and smartphones have radically altered the realities of the telco sector. OTTs and operators are mutually dependent upon each other to drive traffic over the networks- but it is the OTTs who are currently growing revenue through monetizing end-user data, whilst network operators face hefty investments in next-generation infrastructure to cope with increasing demand.

*“Are we really trying to perpetuate an obsolete 100 year-old model of how humans communicate?”*

Martin Geddes,  
Founder, Martin Geddes Consulting,  
[The Changing Landscape of Service Delivery](#)

# Features of the New Landscape



## Differing timescales

This disconnect is enforced by the cultural and generational gap between OTTs, developing applications in the fast-paced, consumer-based IP world, and traditional operators. The timescales for investment, product life cycles and business models are dramatically out of sync; policy makers and regulators are often unaware of the extent of transformation within the industry; and development is in danger of being stifled or delayed beyond market viability.

## The death of voice?

Access to the network is now the basic product, rather than voice - which is increasingly fragmented and embedded as a feature or function of an application such as gaming or messaging, rather than being a standalone billed item. Time, distance and location are irrelevant in the flat IP world, as is the old voice model based on minutes. Voice is "uncool" in comparison with the explosion of data applications and services; exploiting those data services, supported by analytics, cloud computing and software-defined networks, represents a major cultural shift for traditional telcos.

## Fragmentation vs. convergence

The industry is fragmenting into closed proprietary systems operating in silos of communication, and potentially threatening the interconnectivity upon which the global telephony system has been built. As end-user demands continue to shape industry development, the loss of this ubiquitous interconnectivity may even prove acceptable in exchange for personalized, responsive and low-cost services.

There is a contrasting pull towards new collaborations, cooperations and partnerships, both within the industry, in response to these changing dynamics, and across vertical sectors, as convergence on content and services in areas such as banking, health and education grows.

## The importance of local

No one solution, model or ecosystem is or will be suitable for all markets globally; differences of geography, economic and social development, demography and technology remain hugely important. It is local solutions to local issues, locally-relevant applications and development grounded in the needs of local communities that will drive uptake of services and content.

**“ The fact that (the current discontinuity) hasn’t been embraced is because the compulsion to do it isn’t driven by delivering what customers want but by perpetuating what we have at the moment ”**

Dan Warren,  
Director of Technology, GSMA,  
[The Changing Landscape of Service Delivery](#)

**“ The telecommunication industry cannot be (any) more self-sufficient and closed, but should support other industries. ”**

Alojz Hudobivnik,  
Product Marketing Manager, Iskratel,  
[Networks with a Human Face](#)

**“ OTT does indeed represent an opportunity to telcos, and telcos, you really do need to get out there and embrace the opportunity. ”**

Guy Daniels,  
Presenter, ITU Telecom TV,  
[Big Conversation with Telecom TV](#)



# Features of the New Landscape

“ All of the interesting, successful, eye-opening, telecom operator services in the last five years, maybe ten years, have been solo efforts, not collaborative ones. ”

Dean Bubley,  
Founder and Director, Disruptive Analysis, [The Changing Landscape of Service Delivery](#)

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# Changing Business Models

Fighting disruption or seeking to maintain the status quo is ineffective in a world of increasingly and irreversibly IP-based communications. Established players in the telecommunications ecosystem must seek sustainable new business models, focused on exploiting the core competence of operators, separating access and services, and innovative network design.

“What brought us here will not keep us here”

Ulf Ewaldsson,  
Chief Technology Officer and Senior Vice President,  
Ericsson,  
[Forging the Future](#)



# Changing Business Models

## Telco strengths

Traditional telcos have a considerable arsenal of advantages to leverage in constructing new models: network infrastructure, of course, but also established customer relationships and trust, billing systems, identity authentication via subscriber numbers, brand awareness, access to vast amounts of customer data and a recognized regulatory environment.

## Separating services and the network

Separating network access and service delivery allows for a range of layered models. Operators may benefit from sticking to their core competency as a utility, offering a neutral network for external service and content providers with billing and customer relationship management, for example, as optional value-adds. Or telcos may consider splitting entirely into infrastructure operator and services companies; creating new services divisions; investing in innovative service providers or partnering with key vertical industry players in content creation.

Dividing access and content pricing models encourages flexibility and innovation in network and services usage. Moving from the voice model of charging per minute to a system based on bits and usage better reflects the nature of network traffic and captures the value of the bandwidth. It also enables tiered access costs on a free to premium scale, dependent on quality of services offered or peak usage time. Above an established minimum quality threshold, data capacity, speed and quality can be charged at tailored rates.

## Differentiating on quality

Operators can compete on the basis of guaranteed gold-standard quality, remaining a bastion of basic but reliable, secure services which are fit for purpose. The fragmentation of services and products may extend to addressing niche or specific markets, such as B2B, where quality is paramount; vertical sectors; large-scale or critical national projects; or providing a minimal level of universal connectivity for emergency services.

Differentiated investment models are necessary to meet the differing needs of specific markets in terms of technologies and capacities. In emerging markets, basic access over mobile networks is required, and may well reach remote and rural populations before other utilities such as electricity or water. Developed markets call for high-speed, high-capacity networks with a mix of technologies to include WiFi in public hotspots, plus prepaid or pay-as-you-go models to support usage in the current financial crisis.

## Network innovation

Innovative network models and architecture building on software-defined networks will provide an open, programmable platform allowing a range of new personalized services, dynamic and flexible allocation of capacity and an enhanced user experience with the social element at the centre of the network. Networks can move from closed, static pipes to trading spaces for cloud-based applications over a virtualized, tailored “my network”.

**“ In some cases the first utility that people get is communications. They will get that before they get running water and sanitation. That drives a different set of behaviours. ”**

Luis Correia,  
Associate Professor, IST - Technical University of Lisbon, [Networks with a Human Face](#)

**“ The Internet model has been so successful that it’s the model that would change the whole world if we start to realize that the Internet is not competing with them (the operators) ”**

Mohamed Al Mannai,  
CEO, Qatar National Broadband Network, [Frameworks for Competition](#)

**“ Step out of the mindsets of the past and look and create opportunity from the point of view of the customer ”**

Chris Gabriel,  
Senior Advisor, Macquarie Capital Advisors, [Developing Broadband Infrastructure](#)

# Changing Business Models

“ OTT players monetize the audience, a model that is completely ignored by us (telcos). ”

Osman Sultan,  
CEO, du, Forging the Future





# Broadband Supply



Delivering the socio-economic benefits of broadband equitably and to scale requires network deployment using a mix of technologies tailored to the specificities of each market. An integrated, unified approach of mobile, wireless in the home and fibre backhaul may best serve developed urban areas, for example, whereas wireless technologies are key to reaching the 70% plus of the population of developing nations who live in remote and rural areas.

“A few years ago discussions at ITU events essentially had the flavour of ‘If we have competition all problems will be solved; investment will flow; competition will lower things’. Now we’re observing things are a bit more complicated. The structure, the high investment needs, the low marginal costs lead essentially not to competitive environments but oligopolistic environments.”

Eli Noam,  
Professor of Finance and Economics, Columbia University,  
[Funding the Future](#)



# Broadband Supply

## Oligopoly beckons

Next generation networks, whether fibre or mobile, are characterised by tremendous up-front capital expenditure outlay, with an important disconnect between the fast pace of technological development at products and services level, and the long- to mid-term return on investment. New thinking on infrastructure models, financing and regulation is therefore called for, including challenging the assumption that the best way to ensure market development is by enabling competition. Given the size of investment in broadband, accepting (and regulating for) the inevitability of oligopoly or even government-sponsored monopoly may be necessary in many markets.

## The many roles of government

If broadband is accepted as a critical national infrastructure, government has no alternative but to make deployment a strategic priority to ensure universal access where private sector investment is not commercially viable. Government stimulation may include providing infrastructure in rural or remote white

spots through public private partnerships or the imposition of coverage obligations; encouraging open access to rights of way, to submarine cables and to all delivery technologies; and raising public awareness at the highest level of the importance of broadband.

A serious impact assessment of broadband policy implications for the long-term benefit of the nation should balance the cost to industry against the cost to the taxpayer, and may even result in stepping back from universal provision of high-speed broadband in areas where demand is uncertain in favour of basic connectivity and consumer choice dependent on individual consumption.

Managing spectrum transparently and fairly to encourage investment, support a range of technologies, and meet regional needs is vital. Similarly, regulatory bodies must be made aware of the evolving realities of IP-based networks, and its impact on industry dynamics; revisions to regulatory frameworks which ensue must be both timely and transparent to enable growth within the sector.

## Sharing infrastructure

The industry may also adapt to those new dynamics through innovative business models based on non-discriminatory infrastructure sharing. This may take the form of functional separation, disaggregating services such as backhaul for use by any technology, active and passive sharing of infrastructure elements or separating access and service provisioning giving open access to content providers. Linking infrastructure coherently to provide regional utility backbones, including sharing networks with other sectors such as oil or gas, will reduce deployment costs and drive universal access. This could also be achieved through local networks established by entrepreneurs on the ground responding to local needs and then either federating or integrating with national networks.

**“ Broadband access is increasingly important for economic development, information access, cultural exchange, and even national security, so meeting this demand is an issue of global importance ”**

Abdullah bin Mohammed Saud Al Thani,  
Chairman, Qtel, [Opening Ceremony](#)

**“ We believe that providing affordable, high quality Internet access to the citizens of the world is the most effective tool that we have to eliminate poverty ”**

Doyle Gallegos,  
Global Practice Leader Connectivity  
Infrastructure, The World Bank,  
[Lowering the Cost of Broadband](#)

**“ In many markets, we are still wrestling with the basics of simple coverage ”**

Robert Swinnen,  
Vice President and General Manager, Intel,  
[Mobile Broadband Changes Everything](#)

# Broadband Supply

“ *Broadband has high capital expenditures. It's a scale tied technology that doesn't start to generate revenues until the network is completed and people actually are subscribing.* ”

Rob Frieden,  
Pioneers Chair and Professor of Telecommunications, Pennsylvania State University, [Frameworks for Competition in Broadband](#)





# Broadband Demand



Creating and facilitating demand for broadband services and products is vital to increase usage, socio-economic benefits, and sufficient revenue for operators and government to continue investment in infrastructure roll-out. Focusing on supply side and infrastructure alone will not drive broadband to scale.

“ We have a lot of pipes  
and an increasing amount  
of fat pipes but they are  
empty fat pipes ”

Jorgen Abild Andersen,  
DG Telecom, Danish Business Authority,  
The Power of Digital Innovation



# Broadband Demand

## Make it local

Affordable devices targeted at differing socio-economic groups are key to increasing access to the Internet amongst end-users, often the primary focus of end-user demand at present rather than broadband per se. This can best be fuelled by locally-relevant content and services in local language, plus applications arising from or meeting specific local and regional market needs. Wireless devices are frequently and increasingly the first point of contact with broadband in emerging markets in particular.

## Consumer perspective

The perspective of the consumer or end-user is more important than top-down industry or government positions if sustainable models are to be developed. There is a window of consumer enthusiasm for broadband services and applications that will close if demand is trapped by inaccessible or unaffordable infrastructure and services. Maximising the benefits of broadband in the wider society is only

possible with sufficient, educated end-user take-up. End-users need to trust the security, reliability and confidentiality of broadband services to fully embrace the opportunities; and need to be educated from basic e-skills at grass roots level to public awareness at the highest levels of the strategic importance of broadband. Only then can the virtuous circle of demand, usage, revenue and investment be completed.

## Government position

Government has a central role in stimulating demand for broadband. As a major end-user, government can provide better online services at scale, cutting and increasing efficiency for consumer and government alike; as a content generator, government has a particular responsibility in developing convergence models with key sectors such as health, education, energy and transport. Taxation policies may be tweaked to drive uptake of devices and demand rather than throttling success with heavy duties on ICT goods and services; targeted tax incentives may grow locally-developed applications and services.

## Establishing priorities

It is also often a decision at governmental level that can corral infrastructure deployment to meet actual or future broadband demand within a realistic investment framework. This may involve bringing fibre to the local community or access point, then relaying to the home and local end-user through WiFi. There may also be a case for establishing basic connectivity for all as a first and pragmatic step to increasing demand, upgrading to higher speeds and capacities as funding, usage and demand allow, rather than driving straight for high-cost next-generation networks which may not meet current consumer needs.

**“ In many other countries (broadband) demand is being throttled by governments and regulators that get involved in effectively creating barriers rather than removing them, taxing success rather than rewarding success ”**

Mike van den Bergh,  
CEO, Gateway Communications,  
[Stimulating Demand for Broadband Services](#)

**“ What we’re looking at is a fair, consistent, stable and predictable set of regulations in the industry ”**

Lolia Emakpore,  
Director, Nigerian Communications Commission,  
[Stimulating Demand for Broadband Services](#)

**“ You can have an absolutely wonderful broadband infrastructure, but if everybody in the country isn’t regularly using the broadband Internet, then you do not have any social or economic benefits from it at all. ”**

David Lewin,  
Director, Plum Consulting, [Funding the Future](#)

# conversation

## Broadband Demand

“ [Broadband] doesn't just come -- the private sector will provide, but the public sector usually is very slow on developing services. It needs policy and leadership to define a digital roadmap to the future. ”

Suvi Lindén,  
ITU Special Envoy to the Broadband Commission for Finland, [Lowering The Cost of Broadband](#)

K. TAGA

S. LINDE



# Innovation

Innovation is intrinsic to the ICT sector at all levels, from the platform layer of infrastructure to service and content provision, devices and, increasingly, business models. The correlation between innovation and sector growth is undisputed; but fostering innovation can be a complex science, particularly so given the rapid pace of change within the industry.

*“Smaller countries, emerging countries, have become innovation champions”*

Bruno Lanvin,  
Executive Director, e-Lab, INSEAD,  
Digital Innovation



# Innovation



## New sources of innovation

Dynamic new areas of innovation include big data, in terms of understanding end-user needs, developing data analytics and exploiting data as a consumer asset. Cross-sector services, applications and content will introduce new players and unleash opportunities, as will cross-border activities supported by the cloud - and open source development, "the primary facilitator tool for innovation".

## Digital natives

Innovation is increasingly user-driven and content-focused. Users are empowered as innovators at the edge of the network, in particular in small and emerging markets where open source development and lighter regulation are prevalent. Young people the world over, digital natives, are at the centre of usage, innovation and development in the sector, experiencing and responding to ground-level market realities with an immediacy that may be very remote from the experienced upper echelons of most telcos.

## Ground innovation in the local community

It is vital to focus support for innovation at the local level, grounded in the local community and its specific needs, establishing local success before adapting for global use. Customized services and infrastructure take into account the specificities of local environment, demography, geography and economics across differing markets.

Enabling innovation to flourish involves developing e-content and e-skills throughout the pyramid; a balanced, light touch to regulation targeting the context rather than the content of innovation; and an investment in science as the engine behind all technological innovation.

**“ Individual citizens have been empowered by ICTs, so the entire ecosystem needs to join together to fall behind innovations and ensure we have a better environment for the well-being of society ”**

Santhosh Kumar,  
Practice Manager, Wipro Technologies,  
[Innovation in the Telecom Ecosystem](#)

**“ Young entrepreneurs worldwide need local knowledge in order to develop their initiatives which need to have a competitive edge locally. For a self-starting young person, who lacks connections, status and access to privileged information or entrepreneurial circles, very few tools are available ”**

Syed Ahmed,  
Gradberrry, Young Innovators Competition  
Winner, [Youth and Leaders Debate](#)

**“ If you do not invest in science, you will have no new innovations ”**

Didier Fass,  
Associate Professor, ICN Business School and  
LORIA Nancy University,  
[Innovation in the Telecom Ecosystem](#)

# Innovation

*“Innovation in the past used to keep people out.  
Today, innovation is used to bring people in.  
So you have more and more the impact of people.”*

Ali Jazaïry,  
Head of Innovation and Technology Transfer Section, WIPO, Innovation in the Telecom Ecosystem





# Open Source

Over the course of the last century, the locus of innovation has moved from the individual to teams in laboratories and then to open, and increasingly global, networks. The speed, cost and scale of open source innovation, quite apart from its fair and equitable reach, means there is no turning the clock back or retaining the status quo—open source is the future.

“Be careful (bringing) in the old telco reflex of standardization, control, power... when the real money and real innovation happen in the open space”

Thomas Michael Bohnert,  
Senior Research Scientist, Zurich University of Applied Sciences,  
[The Benefits of Open Source](#)



# Open Source



## Bringing down the cost of innovation, meeting local needs

By making technology available to all, open source spreads and shares knowledge, allowing for local customization and adaption to meet local market needs in a globalized economy. This is particularly important in emerging markets, where developers and engineers rely on open source to bridge the digital gap and create tools, applications and jobs at a local level.

Being open to all brings down the cost of innovation whilst speeding up the time to market, a crucial factor in today's IP-based ecosystem. The ease with which products or services can be trialled (and then adapted) in changing markets, the flexibility that cross-company, cross-border collaborations can allow, and the lack of software licensing fees reduce critical costs and drive innovation to scale. Open source code is also visible, making it secure, auditable and simple to assess for quality of service.

## Embracing open source

As an all-but unstoppable force, open source development should be wholeheartedly embraced. This necessitates the adoption of open standards based on mutual respect for autonomy, transparency and intellectual property rules in a new culture of collaboration. Software defined networks enable development to flow, particularly in the customer and business spaces which drive the value of the network- and where most innovation is already open source.

It is, as ever, a question of balance: between speed to market and standardization to ensure international operability, between local needs and global markets and between collaboration and respect for intellectual property.

**“ You need to start hiring fewer lawyers and actually hire software engineers. You have them in your countries ... This is no longer a phenomenon of something that you can only find in the United States. ”**

Alistair Woodman,  
Internet Systems Consortium, Open Source CPE,  
[The Benefits of Open Source](#)

**“ Fast in telecom standards has meant 18 months which, if you talk to anyone in the internet industry today, is the time it takes to create a company, make it rich and then kill it. ”**

Luis Jorge Romero Saro,  
Director General, European Telecommunications  
Standards Institute,  
[The Changing Landscape of Standardization](#)

**“ Generic technology is fundamental to spread peace around the world ”**

Latif Latid,  
President, IPv6 Forum,  
[The Benefits of Open Source](#)

# Open Source

“Local innovation is already exploding ... because of the prevalence of open source capability throughout the world.”

Barry Greene,  
President, Internet Systems Consortium, [The Benefits of Open Source](#)







# Big Data

There is no doubt as to the potential value of the huge volume of data generated by corporations, governments and individuals. Releasing that value involves data mining, storage and analysis at enterprise level; understanding and investing in the socio-economic benefits of data flow at government level (in fields such as health and traffic); and trust, legal and commercial frameworks to both protect the consumer and exploit personal data as an economic and social asset.

*“The value of data  
is in the flow of data”*

John Clippinger,  
Founder and Executive Director, IDCubed,  
[Who Owns My Data?](#)



# Big Data



## Data as the new asset

Data as an asset has no value until it is extracted, given meaning and allowed to flow safely and securely. It can then be monetized through innovative services and complex analytics, such as predictive behavioural models, location-based services, life-logging, and personal data vaults offering secure storage and targeted access facilities.

## Consumers need trust and transparency

Protecting privacy and establishing trust through frameworks of rights and responsibilities, best practice and regulator-enforced standards are essential to enable data to flow. The consumer is centre-stage, as both the source of data and the market for value-added, personalized services. Empowering the consumer, thereby driving usage, calls for transparency on data collection and use- and the ability to opt in or out of data disclosure to varying degrees on a sliding scale.

But addressing data in terms of property rights ownership is complex and barely viable, given the volume of existing data and the speed with which it is constantly generated. No organization or entity has absolute control; it is impossible to guarantee definitive deletion of data in a viral world of perfect copies; and there is no way to ensure security. Dealing with the reality of big data involves a continual balancing act of checks and controls between data mining and data governance to manage risk.

## Playing to telco strengths

Importantly, traditional telcos have two unique advantages in the data space: holding huge amounts of data through existing customer relationship management structures, and consumer trust as custodians of that data in a highly-regulated industry sector.

**“ There is an opportunity not only to generate value not just for (telcos) but for users and third parties who want to interact with users through personal data. ”**

Simon Torrance,  
CEO and Founder, STL Partners/Telco 2.0 Initiative,  
[Who Owns My Data?](#)

**“ Are we sharing too much information unnecessarily that may come back to haunt us in the future? ”**

Taha Kedro,  
Partner, PricewaterhouseCoopers,  
[Are We Really Secure?](#)

**“ Nobody has data about the customer as much as the telcos have. ”**

Ahmad Abdulkarim Julfar,  
Group CEO, Etisalat,  
[The Power of Digital Innovation](#)



# Big Data

“ (Life logging plus the quantified self) could, not so far from now, lead to some kind of digital immortality. ”

Clément Charles,  
CEO and Founder, [AllTheContent.com](http://AllTheContent.com), [Who Owns My Data?](#)





# Privacy & trust

Consumers in the era of big data and rampant social networking are increasingly aware of the threat to privacy and data confidentiality posed by the largely anonymous and unregulated collection, analysis and sale of data for commercial and political gain. Images and other data are used without explicit consent, inaccurate, outdated or inappropriate material may remain permanently accessible online with harmful consequences, and any interpretation of data is highly subjective and potentially damaging.



“ The real objective of (data protection rights) is to protect the fundamental rights of people: dignity, liberty and freedom. ”

Luca Bolognini,  
President, Italian Institute for Privacy,  
[Are We Really Secure?](#)



# Privacy and Trust

## Dangers of data

Data is held, distributed and analyzed globally rather than locally, with no clear jurisdiction or established regulatory framework to deal with any disputes. Additionally, targeted advertising may be disruptive or intrusively personal; and searches based on behavioural analysis models return restricted data, limiting exposure to new information and the spread of knowledge globally.

## Privacy is a local concept

But mistrust and concerns over confidentiality are as contextual as conceptions of privacy. Different cultures ring-fence the role of the individual in the community with differing expectations of privacy; the popularity of crowd-

sourcing applications demonstrate that people are willing to reveal personal information in the name of the greater good; and the growing percentage of the world's population under the age of 25 are markedly freer in sharing data, to an extent considered both naive and perilous by older generations.

Data ownership, rights and responsibilities remain unclear and largely unenforceable and absolute privacy or security will never exist. Managing data flow and confidentiality involves balancing freedom of expression against government policy, consumer convenience and personalization against privacy and, above all, security against human rights, liberty and dignity. Building trust through open dialogue with all stakeholders is essential to achieve this balance.

The consumer must be empowered- and educated- to take personal responsibility for data, controlling disclosure as far as possible through meaningful consent. A framework of rights and responsibilities for both the individual and entities could establish best international online practice, including clearly-worded, accessible privacy policies, transparency in data collection, storage and use and the ability to enforce penalties for any breach.

The way forward may be encouraging a form of digital citizenship, where a culture of responsibility transfers offline values to the online world; or even creating a bill of rights, stating principles that are universally accepted as the basis of a global framework of international jurisdiction.

**“ The word privacy is going to be something which is very open-ended and... hard to define ”**

Mohammed Al Ghanim,  
Director General, TRA, [Protecting the Future](#)

**“ Maybe in 10 or 15 years’ time the children of today are going to say: What were you all thinking? Why didn’t you do something? ”**

Maxwell Thomas,  
CEO, The Cyber Guardian,  
[Locking the Digital Door](#)

**“ The main issue with trust is getting an international level collaboration between the private sector and the government sector ”**

Harm Jan Arendshorst,  
Head of Professional Services, Verizon Business,  
[Who Owns my Data?](#)

# Privacy and Trust

“Create transparency and explain the complexity”

Klaus M. Leisinger,  
Chairman, Novartis Foundation for Sustainable Development,  
[Big Conversation with the BBC](#)







# eHealth

There is no doubt as to the tremendous potential of eHealth to redefine healthcare by increasing access, improving the quality of care, saving lives and saving costs. In a \$6 trillion industry, where one in every ten dollars worldwide is spent on healthcare, the value to governments, business and consumers alike is huge. But eHealth is failing to deliver on that promise or capture that value.

*“eHealth is not going anywhere as of today”*

Joe So,  
VP Business Sales, Huawei,  
[Towards Sustainable Healthcare Systems](#)



# eHealth

## A jungle of pilots, stakeholders and apps

From simple SMS-based information services to cloud-based health record systems, the array of pilots running successfully in emerging and developed markets alike is impressive- but the tipping point, the realization of sustainable e healthcare, has not yet arrived.

This is largely due to the inherent nature of healthcare systems: complex, multi-stakeholder, slow-moving, conservative and unwieldy. Government, academia, NGOs, and a range of healthcare professionals are interlocked- even without the addition of ICT technologies bringing contrasting developmental time-scales, values and culture.

eHealth itself is a jungle of devices, formats, models, applications and technologies, arising in part in response to regional specificities of geography, demography, economy, lifestyle and degree of connectivity. Local eHealth solutions to those challenges include screening, measuring and surveillance

of communicable diseases to respond to the development of potential epidemics on the ground; empowering healthcare community workers with basic tools of diagnosis and intervention in rural and remote areas where the doctor-patient ratio is low; enabling the management and monitoring of chronic, non-communicable diseases in the home rather than the hospital; efficient, cost-effective management of disbursement and inventories; easy identification of fake drugs; and the use of data analytics to extend medical research.

## National strategies driven by compelling evidence

But this multiplicity and complexity threatens to limit the benefits to a plethora of small-scale, disconnected pilots without some form of national eHealth architecture. Establishing joined-up policies and strategies at regional, national and even international levels calls for constructive, multi-stakeholder dialogue and collaboration. Collective efficiency is more important than ongoing pockets of one-off excellence.

This necessitates compelling stakeholder-centred evidence of the social and economic value of eHealth to each participant in the chain, shifting ministerial mindsets and releasing private sector funding. Without sufficient investment, and without regulation driving standardization, quality of service, data confidentiality and interoperability, eHealth will not be taken to scale - and costs will remain prohibitive.

## Patient/customer focus

Developing new business models in the B2C (business-to-consumer) sector, in particular in terms of home-based monitoring and intervention in non-communicable diseases, patient-owned eHealth records and preventative health information schemes, may be key. Consumers are readier to accept innovation and understand the direct personal benefits of eHealth; and patients in many cases pay directly or indirectly for healthcare.

**“ B2C is where the promise, the real promise, lies ”**

Hani Eskandar,  
ICT Applications Technical Officer, ITU-BDT,  
[Towards Sustainable Healthcare Systems](#)

**“ Mobile healthcare ...can standardize things. It can specialize things. And it can actually provide care at a higher quality and a lower cost in many cases than the traditional models ”**

Jennifer May,  
Health Systems Practice Manager,  
McKinsey & Company,  
[Towards Sustainable Healthcare Systems](#)

**“ Without a strategic plan, things will continue to be in pilots and pilotitis will continue to spread as an epidemic ”**

Najeeb Al Shorbaji,  
WHO, eHealth: Turning Challenges into  
[Opportunities for Better Health Services](#)



# eHealth

*“The resistance of these multi-stakeholder systems is very complex... we can accelerate by talking directly to the consumer (who) is much readier to accept an innovation than the system itself.”*

Alessio Ascari, CEO and Founder, Quasar Med, [Towards Sustainable Healthcare Systems](#)







# Cybersecurity

Critical national infrastructure is no longer custom-built but uses off the shelf products and is often connected to the Internet to take advantage of latest innovations. This exposes nations, corporations and individuals to cybercriminality and cyberterrorism with the potential to paralyze countries and threaten the entire global economy.

“ 80 percent of cyberattacks can be prevented by deployment of right, effective IT security technology and by deploying and training your IT security teams. ”

Suleyman Anil,  
Head of Cyber Defence, NATO,  
Ensuring National Cybersecurity: Protecting Critical Infrastructure



# Cybersecurity

## Difficulty in identifying cybercriminals

Tackling cybercrime is complicated by the flat and open nature of the Internet. It is difficult to establish accountability and enforce legal penalties when actions can be measured in nanoseconds and may originate from any part of the world or any jurisdiction. Cyberattackers may be governments, terrorists, criminals, hacktivists or random individuals; locating the source of or understanding the motivation behind an attack is problematic. No single super-power can regulate a cyberwar, and no jurisdiction holds global sway, reducing the perceived risks of cybercriminality.

Software is easy to replicate and reproduce, leading to a proliferation of cyberweapons and the swift and continual evolution of malware. The race between criminals developing new malware, and security or legal experts countering this malware, will never be definitively won. Private sector involvement in the provision and operation of almost all critical national infrastructure links government and industry closely, and at times uneasily, in this race.

## International collaboration to build capacity and share information

A meaningful response to cybersecurity therefore calls for international, multi-stakeholder cooperation and coordination. The international community is only as strong as its weakest link, which may often be in emerging markets where resources, capacity, legal and technical training are more limited. To avoid creating a security divide or cybercrime safe haven, and for the good of global cybersecurity, effective mechanisms must be established to bring together government funding at national, regional and international levels. Capacity-building, law enforcement and training is a pragmatic imperative for governments and multi-national corporates alike, given the mutual interdependence and connectivity of cyberspace.

It is important to define frameworks for communication and sharing knowledge on new malware, technologies, research and best practice both within individual governments and organizations, and across borders. International consensus

on standard behaviour around critical infrastructure, on the response to threats and the non-proliferation of cyberweapons may extend to some form of international treaty- it is generally agreed that the best way to win the war in cyberspace is to simply avoid the war.

## Encouraging disclosure

Building trust with law enforcement platforms or third parties may encourage private and public sector organizations to disclose major incidents and enable critical information to be shared in a timely fashion for global benefit, in the absence of a global policy on mandatory reporting. Equally, redesigning software systems to incorporate sophisticated security, prevention and resilience features will reduce the threat of future attacks.

## Cyberhygiene

However, systematic cyberhygiene alone - effective basic maintenance, regular system updates, proper management and good practice and processes - could thwart the vast majority of cyberthreats and forestall attacks.

**“ The threat has changed from being a threat which was simply blocking up the network with unnecessary packets and slowing systems down into targeted attacks on particular pieces of information or particular processes, and that’s a fundamental shift ”**

David Pollington,  
Director of International Security Relations,  
Microsoft Corporation, Ensuring National  
Cybersecurity: [Protecting Critical Infrastructure](#)

**“ When you have a private company that’s providing services critical to the national infrastructure, how do you cooperate with them in such a way that they feel safe and they, you know, also be there the next year for doing business? ”**

Jonathan Dharmapalan,  
Global Leader Telecommunications, Ernst &  
Young LLP, [United We Stand: International Cooperation for Tackling Cyberthreats](#)

**“ (Cyber attack) is only a USB stick away ”**

Steve Adegbite,  
Director of Cyber Security Strategies, Lockheed  
Martin, [Ensuring National Cybersecurity: Protecting Critical Infrastructure](#)



# Cybersecurity

*“ We need to make governments talk the same language to each other and to agree that cyberweapons are forbidden ”*

Eugene Kaspersky, CEO and Founder, Kaspersky Lab,  
[Breaking the Silence on Cyberwarfare](#)



## Further information and sources

All content in this report, including quotes, is drawn from the interactive panel sessions at ITU Telecom World 2012. This report is also available online as part of a dedicated ITU Telecom World 2012 Outcomes microsite at [world2012-outcomes.itu.int](http://world2012-outcomes.itu.int). All sessions can be viewed as video on-demand at [world2012-live.itu.int](http://world2012-live.itu.int)

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