ITU Telecom World 2013

The Outcomes

ITU TELECOM WORLD '13

Bangkok 19-22 November


We knew you'd be here. Is Big Data's predictive power threatening freedom and anonymity?
What new regulatory and standardization approaches do we need?
The world is greedy for data. Can you keep serving?
Industry dynamics are shifting. Are you?
OTTs are ringing the changes. Can telcos answer?
Voice is fading fast. How can you make yours heard?
Is your city smart enough to sustain the pace of life?

Content

Foreword

By Dr Hamadoun I. Touré, Secretary-General

It is my great pleasure to introduce this year's Outcomes Report, the result of in-depth analysis of more than 55 forum panel debates, workshops, ministerial roundtables, keynote speeches and showfloor sessions held at ITU Telecom World 2013 in Bangkok, Thailand, last November.

The event brought together leading representatives of the ICT industry from the public and private sector, executives and ministers, innovative thinkers, consultants and academics from developed and developing economies alike to share ideas and best practices, to shape strategies, policies and business models, and to connect individuals and ideas in conversation.

Expert speakers debated the radical transformation of the ICT sector, and of our society itself, from the differing perspectives of business, policy and technology. The focus for passionate, stimulating and informative discussions was on five principle areas of change: new ways of communicating, new approaches to regulation and standardization, new industry dynamics and value chains, new business models and new technological developments.

The overwhelming message that emerged from the conversations at the event was the urgent need for the industry to change its culture, mindsets and business strategies to embrace the new realities of our digital world. The growth of network functions virtualization and software defined networks is moving communications technologies to information technologies, merging computing and the networks. Machine-to-machine communications and the Internet of Things offer enormous potential for new markets and revenue, in particular through partnering with governments and vertical sectors. Big data analytics, convergence with media and broadcasting, new approaches to sharing spectrum, the exponential growth of mobile broadband, regulatory modernization, the importance of emerging markets and digital natives, collaboration- or competition- with over-the-top players, new voice and data products and apps, leveraging operator assets in networks and customer base: the opportunities are dizzying in a world of disruption.

I hope that you can gain insight, enjoy and benefit from the key findings from ITU Telecom World 2013 presented here- and look forward to continuing the debate both online and in person throughout the year and in December in Doha, at ITU Telecom World 2014.

"The overwhelming message that emerged from the conversations at the event was the urgent need for the industry to change its culture, mindsets and business strategies."


NBTC
TCEB
ITU
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'13
not forget here in high-tech Bangkok that most
of the world's people are still unconnected,
without access to the
1 conversation that matters

Introduction

by Dr. Stuart Sharrock, Forum Curator

This report attempts to bring together the ideas, arguments and recommendations of some of the most informed, expert minds exploring issues around the tremendous transformation of the telecommunications industry today. It represents the key findings arising from four days of debate at ITU Telecom World 2013 under the central theme of Embracing Change in a Digital World, but is neither prescriptive nor comprehensive; it is intended as a wrap-up of the event, an introduction to the state of the industry and an invitation to continue the conversation at ITU Telecom World 2014.

Change has long been a defining characteristic of technology-driven industries such as telecommunications. But the pace and extent of that change is now dizzyingly unprecedented. One small example- a successful mobile app brought swiftly to market by a handful of entrepreneurs can disrupt the entire industry in a matter of weeks. Major new technological, social and commercial developments are continuing to shake the foundations of the industry sector to the extent where it is clear that the old way of doing things is no longer a viable option. Time and time again speakers at World 2013 urged a change of mindset, a paradigm shift, new approaches, models and markets.

Arguably the single most significant element of change is the encroachment of IT into IP-based telecommunications, the intersection of two industries, skill sets and cultures. Network functions virtualization and software defined networks are becoming a reality, bringing new meaning to the ICT acronym: the future is truly a fusion of information and communications technologies. The huge potential growth represented by convergence with media and broadcasting sectors, and intimate partnerships with vertical markets from manufacturing, logistics and transportation to power utilities, health and banking, push the telecommunications industry further out of its comfort zone and into a new arena of interlocking cultures, expertise and business models. Telcos must move quickly into these new market spaces, or risk losing a dominant position in the evolving ecosystem, forfeiting a valuable chunk of the new digital economy pie.

To do so successfully may often involve learning another language. Speak to each specific vertical sector, government department or enterprise with the relevant vocabulary, strategy and framework of benefits, open up conversation and collaboration. Telecommunication providers must mutate into both communication service providers and communicators. Dialogue is the basis of future business models. Connectivity alone is no longer sufficient.

Two opposing forces are shaping the industry outlook: fragmentation and interdependence. The growth of M2M communications, IPv6, the Internet of Things and virtualization will allow for thousands of specific-purpose networks and subsystems; shifting from a supply-driven to a demand-driven, customer-focused industry will lead to products and services designed for context and purpose, differentiated for quality, price and function. Hyper-personalization (in particular in mobiles), the importance of local content, the impact of emerging markets, the granular detail of big data analytics, the plethora of new rich voice products, hybrid approaches to broadband deployment- there is no one size fits all, no single regulatory fix, business model or guaranteed interoperability.

It's an overwhelming new concept. What remains is a complex ecosystem of interlocking elements, markets and skills. This report is divided into eight topics for convenience and clarity. But the breakdown is largely artificial, as any one of those topics is deeply linked to all the others. Take e-education, or the transformation of education through the digital economy, for example. It involves the need for human capacity development, cross-ministry collaboration, multi stakeholder partnerships; regulatory modernization to guide the convergence of education and ICT; the need for available spectrum, for broadband connectivity, for affordable devices; the encroachment of IT as

information is stored in cloud-based data centres and made actionable by big data analytics; fears on security and loss of privacy. It highlights the importance of digital natives, the empowered, informed, and creative end-user, the role of local content, the government as enabler. It illustrates the need for telcos to break away from their legacy processes that are now too often impeding progress. How telcos must straddle the old world of providing access and maintaining customer relationships whilst embracing the new- the potential of innovative technologies, services, markets and models. The new reality is a complicated sum of parts requiring open communication- and conversations such as these.

Features of the New Reality

Disruption at an unprecedented pace

Massive disruption in the communications industry has reached a tipping point: telecommunications operators cannot hope to continue in old models and mindsets and survive. Exponential technological and societal changes are driving new business models in new, wider arenas of industrial activity, breaking down barriers between discrete sectors and opening up opportunity. The pace of change in this new reality is unprecedented; to compete and succeed calls for a radical shift in telco culture and mindset.

Features of the new reality

Virtualization, the Internet of Things

The single most radical change to the industry is the move to IT-based network infrastructure through network functions virtualization and software defined networks. Virtualizing elements of the network enables dynamic provisioning for efficiency, flexibility, scalability and traffic optimization. Full-scale virtualization within five years offers the prospect of thousands of specialized, configurable, cloud-based networks, including virtual mobile networks for dedicated smart services. Managing this transition and intersecting with IT skills and culture is key.

Building on machine to machine (M2M) communications, the Internet of Things will connect billions of unconnected devices to each other, to people and the internet, interacting in real time over common standards and generating vast amounts of data. Getting the business model right will allow telcos to play a pivotal role in a hugely valuable new ecosystem driving efficiency, sustainability, elasticity and economy across multiple vertical sectors.

“We now see the most important competition for many industries not being other firms within the industry. It’s other industries!”

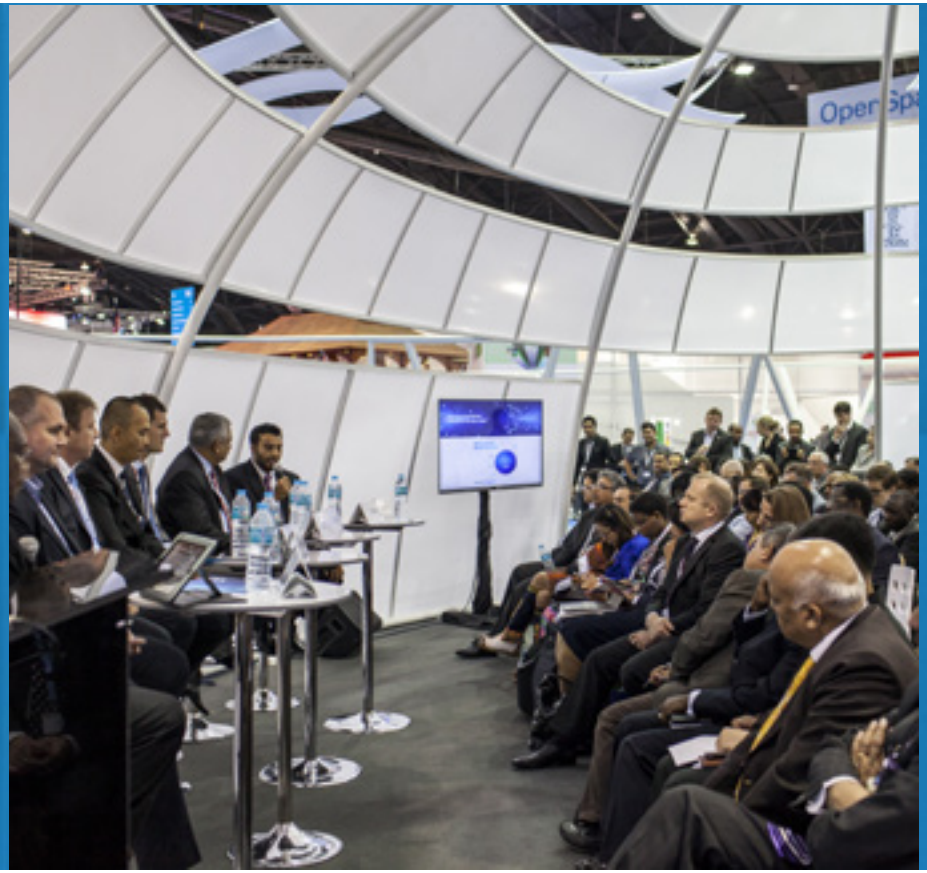
Gerd Leonhard,
Futurist and CEO , The Futures Agency , Visionary Keynote

Features of the new reality

Big data and regulation

The unimaginable quantities of data produced by M2M sensors, smartphones and social networking will enable the big data economy to grow, with enormous societal benefits and commercial opportunity. Big data analytics make raw data actionable and therefore valuable, using whole data sets rather than sampling to seek trends and correlations. Establishing trust frameworks to resolve the current privacy and security crisis is fundamental to ensure full participation and open, transparent data flow, and represents a major regulatory challenge.

Reassessing and modernizing regulation in response to the new technological and market place realities must focus on spectrum sharing, universal broadband connectivity, smart solutions over M2M and converging industry sectors as well as data privacy. The convergence of telecommunications and media, content and broadcasting, and the partnering of telecommunications and vertical sectors such as health, education and energy call for a breakdown in silos between industries and regulatory bodies, collaboration and a swift response to claim new market spaces.



Straddling the old and the new

Operators must manage the transition towards IT-based networks and cloud-based services whilst maintaining quality in their legacy services. Selecting what elements to keep from the old world, such as universal service agreements (perhaps in modified form), accessibility, ubiquitous interoperability and emergency services, represents a challenge, given the overwhelming pace of development and fragmentation of ever-more individualized services and networks.

It is time to engage with rather than resist over-the-top (OTTs) providers offering services over operator networks which threaten revenue and relevance. Operators must focus on their core assets of the network and customer base to compete with their own value-added services, collaborate with OTTs or buy in expertise. Investing in innovation includes consumer and enterprise services differentiated on quality or price via the dynamic allocation of IT-based networks, digital back office services or new voice products.

“Only 1% of the things that could be connected are connected. Probably even less than 1%. Most things have yet to be connected.”

Robert Pepper,
Vice President, Global Technology Policy , Cisco Systems , The Internet of Everything

“I don’t see people paying for voice five years beyond today.”

Andile Ngcaba,
Executive Chairman , Dimension Data,
Lions Go Digital: The Economic Impact of the Internet on the African Continent

Features of the new reality

Mobile in emerging markets

Deploying broadband to ensure universal connectivity is dependent upon a mix of government involvement, competition, subsidy, spectrum sharing and spectrum efficiency, and mixed technologies (including small cells, wifi offload and fibre backhaul fibre backhaul)- a balance of interests unique to each particular market or nation. Mobile dominates broadband services, driven by the convenience of smart devices and its practical and cost-efficient implementation in emerging countries. The mobile market space is unpredictable and fast-changing, shaped by new apps, devices, content, players and growth of mobile cloud networks.

Mobile broadband will focus on those emerging markets, designing future devices and models to meet the huge volume growth in developing nations in a major strategic shift. Emerging markets are an important locus of innovation as well as local content and solutions developers; it is here that the greatest benefits of new technologies and services may be experienced, as a clean infrastructure slate enables developmental leapfrogging (such as moving straight to 4G services, and smart solutions on water, health or education).

> *“Network operators are currently facing a major change to come from network company into IT company.”*

Thomas Magedanz,
Head of NGN Division , Fraunhofer Institute FOKUS, Network Virtualization

Human-centric

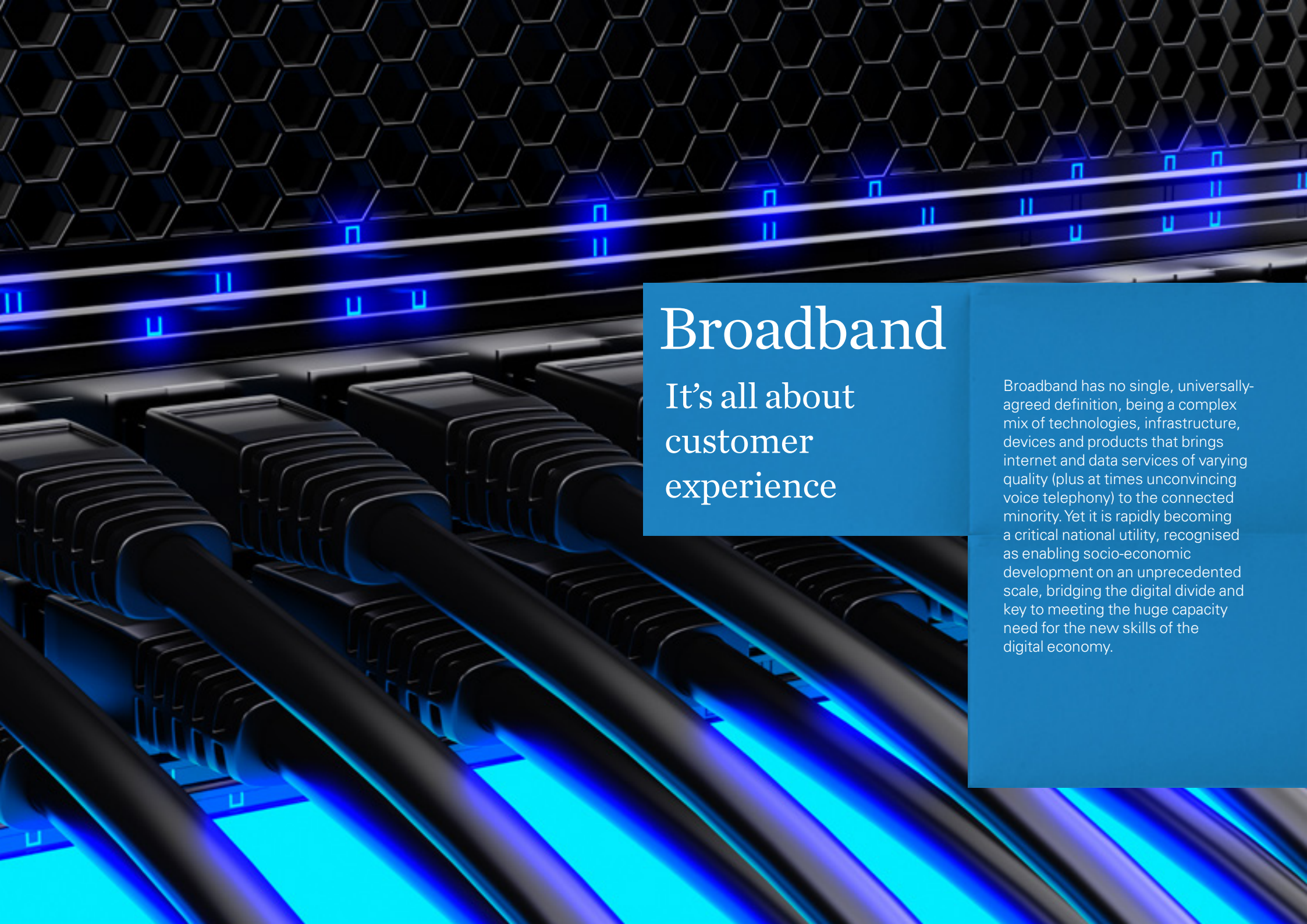
Human emotions are at the heart of the telecommunications industry, from customer loyalty and relationships to trust, privacy concerns and the highly-personal nature of the mobile phone as a communications portal and token of identity. Social media, multiple devices, the growth of mobile, open source and innovation at the edge of the network are placing the informed and empowered consumer at the centre of a demand-driven market. A richer understanding of what humans do with technology in life is important, particularly with respect to the digital native generation, born with devices at their finger-tips, brand and technology agnostic, with radically different perspectives that will shape the future.

"We're trying to apply older management techniques and organizational structures to a world that's fundamentally changed."

Peter Mercieca,
Partner, Technology Media & Telecommunications, KPMG, Mobile Technology and Productivity in the Enterprise

"The traditional telco model is unsustainable. It's unprofitable. You have to look at infrastructure as a commodity. You have to look at a differentiated service model and no amount of regulation can solve that problem."

Chris Gabriel,
Former CEO , Zain Africa,
Mobile Technology and Productivity in the Enterprise



Broadband

It's all about customer experience

Broadband has no single, universally-agreed definition, being a complex mix of technologies, infrastructure, devices and products that brings internet and data services of varying quality (plus at times unconvincing voice telephony) to the connected minority. Yet it is rapidly becoming a critical national utility, recognised as enabling socio-economic development on an unprecedented scale, bridging the digital divide and key to meeting the huge capacity need for the new skills of the digital economy.

Broadband

“The real value is in the services, not the competition, because competition is easier to achieve in businesses or in densely populated areas, but in rural areas, forget it.”

Jaume Salvat,
Founder & Partner, Aggaros, Funding and Pricing of Next Generation Broadband Networks

Competition is king, until the market fails

But leaving broadband deployment to market forces and the catalyst of competition is not enough in many remote, rural, under-populated and underserved regions where no viable business case can be made. Government must step in, in one form or another, dependent on the nature, topology and development of each market. Direct investment in national broadband network infrastructure, regulating for structural separation and competition at services and retail level, is one extreme. More widely relevant is the provision of an enabling environment, including incentives such as regulatory holidays or tax breaks for investing operators, regulating for open, non-discriminatory, affordable access, plus facilitating mobile broadband roll-out through spectrum beauty contests with a coverage requirement for uneconomic areas, spectrum refarming or the repurposing of underused and digital dividend spectrum.

Public private partnerships, innovative broadband deployment over and in conjunction with other utility networks such as electricity, and educating government and citizens alike on the real benefits of broadband-enabled services are important measures. Direct subsidies, with the inherent risk of distorting the market, should be directed not at networks, but at the end-user, through vouchers, subsidized devices or subscriptions, digital literacy and training programmes, and the provision of locally-relevant content.

“Speed or bandwidth in context of broadband is no longer a helpful model for thinking about this product or service.”

Martin Geddes,
Founder, Martin Geddes Consulting United Kingdom, Future of Broadband

“The network we’re dealing with today is not the network that we had yesterday. We’re dealing with an IP-based network, the skill sets involved are very different.”

Laina Greene,
CEO , GET-IT, Green Energy Technology and Info-communications Technology, Delivering Broadband to Rural Areas

Broadband

Local solutions

A highly local approach to content, applications, skills and affordable access such as shared-use models will drive demand and adoption in local communities, encouraging a burgeoning sustainable ecosystem open to entrepreneurs and service and product developers. The challenge of providing sufficient power in many remote areas may be overcome through judicious use of renewable energy sources or access to the grid with the telco acting as anchor tenant. Easy availability of affordable international connectivity is vital to support future data demands, access international content, connect to infrastructure such as data warehousing, and ensure security and reliability. Regional internet exchanges can reduce cost and latency and increase speed with infra-community networks and a network of local ISPs offering a platform for content distributors and international operators.

Broadband is not always broadband

New approaches to universal service funds may include financing such subsidies to increase demand, or funding fibre backhaul programmes and spectrum release for mobile broadband, the quickest, most efficient and feasible technology in many remote and unconnected regions. Affordable access is critical, and best achieved by a holistic use of complementary technologies encompassing satellite, mobile, wifi, fixed legacy networks and fibre as appropriate to the local context. Differentiated broadband services will meet local needs, including relying on lower-speed, lower-cost non-traditional carrier grade technology: fibre optic networks will eventually be necessary to provide backhaul and guarantee customer experience.

Quality of experience

Quality of customer experience is vital to ensure the successful adoption of broadband services for greater public good. This quality of experience is provided by stable, low-variability networks (stationarity), rather than by increased capacity per se. Operators should reconsider kneejerk capex-intensive upgrades aimed at increasing bandwidth, focusing instead on reducing loss and delay in scheduling packets. Intelligent scheduling can allow network operators to provide broadband products differentiated on price according to quality and fit for a range of end-user purposes.

“Subsidize the users, not the network.”

Helen Lai, Head of Regulatory Division, Office of the Communications Authority (OFCA) Hong Kong, China, Balancing Competition and Subsidies in Broadband Promotion

“Most of the technology has moved from circuit switched to digital but the business model is stuck in the circuit switched stage.”

Steve Bell,
President , KeySo Global ,
Telecoms Innovation is Going Over the Edge..is is Time to Pivot?

“Of all the broadband devices in the world, in 5 years time the vast majority will be mobile and will be used in low-income countries rather than high-income countries.”

David Lewin
Director, Plum Consulting,
Multiple Media over Multimedia

“Broadband is becoming a form of critical national infrastructure. The whole of society is reorganizing around the assumed existence of broadband.... Telecoms isn’t just about creating a profit for shareholders. It is about creating a digital society - and when we do that, there is an implicit social contract.”

Martin Geddes,
Founder, Martin Geddes Consulting
United Kingdom, Future of Broadband

Spectrum

The end of exclusive licensing?

Exponential growth in demand for mobile broadband- and the spectrum upon which it depends- is driven by lower-cost smartphones, devices and apps, the adoption of mobile as the technology of choice in many emerging markets, and increasing awareness of the socio-economic benefits of access to data and services. Future enriched multimedia experiences, global personalized services, the convergence of vertical sectors and the pervasive growth of mobile can only increase the demands on spectrum. Meeting the spectrum challenge involves creative, efficient use, reuse, allocation and sharing of bands- opening up mindsets and spectrum policies to move away from exclusive licensing.

Spectrum

Innovative spectrum policies

Above all, there is an urgent need to reconsider spectrum policies which were designed decades ago for symmetric voice communication on slower rates than today's content and video. Balancing different claims to spectrum from government and commercial services, licensed and unlicensed applications, new technology and old, terrestrial and satellite-all within the social and moral obligation to ensure universal access and emergency services takes political will and innovative policies.

Authorized spectrum access sharing moves beyond the traditional allocation of a single licence to a single operator "owning" a piece of spectrum. An operator would instead be able to access spectrum underused by its current incumbent on a geographical, database or time basis, guaranteeing quality of service through dynamic allocation and careful regulation. Spectrum licensing should be considered as a lever to drive penetration, efficiency and reinvestment in the industry, rather than a convenient source of government income. Further innovative approaches include favouring technology-neutral competition over open spectrum, rather than tying a specific band to a specific use, vertical or technology; and encouraging reverse auctions, enabling broadcasters to state the price at which they are willing to exit incumbent bands.

"Regulators (must) facilitate the ecosystem that includes broadcasters, telcos and new entrants like Google and Microsoft. I foresee that being a significant human challenge."

Andrew Batten,
Regional Director, BT Advise for Communications Asia Pacific, Squeezing Spectrum

"There are more people in the world with mobile phones than there are with electricity. There are more people with mobile phones than people who have toothbrushes."

Alex Orange, Director, Government Affairs, Southeast & Pacific, Qualcomm International, IMT Vision

"One segment of government recognizes spectrum as a way to make money, quick bucks, but the other looks at spectrum as vacant for broadband and the market is caught in between."

Abu Saeed Khan,
Senior Policy Fellow, LIRNEasia,
Riding the Data Wave

Spectrum

“The potential for the APT band is to be perhaps the biggest single spectrum band ecosystem we have seen in the world.”

Mike Wright, Executive Director Networks & Access Technologies, Telstra, Impact of Spectrum Options on Device Availability

Managing spectrum

An inventory of actual usage of spectrum, expected traffic, future requirements and spectrally-efficient technologies will enable the reallocation or reassignment of bands currently lying fallow, or under-used by incumbents such as government security or military. Additionally, spectrum used for 2G 900 MHz can be refarmed for LTE higher-speed services; and the full exploitation of underutilized white spaces facilitated through automatic transmitter reconfiguration, with regulators acting as neutral moderators. New technologies such as carrier aggregation and dynamic spectrum assignment will open up the full potential of spectrum bands.

The transition from terrestrial to digital television opens up a digital dividend of spectrum which can be redeployed for mobile broadband services; but political will is necessary to overcome the resistance of incumbent broadcasters, cover the costs of migration (including set top boxes, local content and consumer education) and promote awareness of the bands. Harmonization across markets is important to optimize economies of scale, but also to enable seamless connectivity and drive take-up.

The APT 700 band has outstanding potential global availability, reaching more than 2 billion people worldwide outside North America and providing a broad, harmonized, single band ecosystem with unprecedented scale.

Heterogeneous networks

Redesigning network topology and architecture to include complementary licensed and unlicensed technologies and heterogeneous networks can optimize the network in dense areas, spreading both investment cost and revenue, and best meeting local market needs in efficient, seamless service. Mobile services can be integrated with offloading onto small cells within enterprises, residential and public areas to improve quality of service. Complementing mobile (and 4G services in particular), wifi is constrained in power and coverage but is vital for supplementary back haul to provide seamless services in the home and urban area- as well as for future mobile onload to increase customer end-to-end experience. Satellite services also provide further backhaul capability for mobile data offload in rural areas. Regulatory flexibility on small cell licensing and hybrid satellite-mobile services will expedite efficient, innovative heterogeneous networks.

“Four very difficult spectrum policy tradeoffs: Government users versus commercial, licensed versus unlicensed, terrestrial versus space, and new technologies versus old technologies.”

Peter Pitsch,
Executive Director Communications Policy and Associate General Counsel, Intel Corporation, Spectrum for the Future

Sharing satellite bands?

Debate continues on reallocating spectrum from satellite to mobile services, or encouraging spectrum sharing across the two technologies. Regulatory authorities and policy must balance the relative societal benefits of satellite and mobile, meet long-term objectives for use of spectrum and factor in customer applications and choice. Satellite provides core communications in many remote villages, and is a mission-critical link between end-user and backbone networks, TV broadcasters, viewers and advertisers. Migrating from the C band currently targeted by mobile services would result in loss of service and a very real impact on end-users, given that higher frequencies suffer from reliability issues in the high rainfall density regions of the world. Sharing spectrum with mobile is impractical, as the ubiquity of mobile services does not allow for the creation of effective exclusion zones, with interference seriously affecting connectivity. Sharing uplink bands (and addressing asymmetry) is easier as these are limited in number and exclusion zones can apply; given a high level of mutual trust and exchange of operational information, spectrum sharing by wireless broadband and satellite services may be possible. Compression technology continues to improve, enabling more efficient use of spectrum, but is countered by increase in demand.

Emerging markets may face greater spectrum challenges as mobile broadband, the most efficient and cheapest route to connectivity, is increasingly rampant; but they may also be able to leapfrog the legacy technology of developed markets and move straight to next generation networks and concomitant benefits. If governments do not actively encourage mobile broadband deployment, spectrum allocation may be a moot point.

“The ubiquity of the mobile service really changes the equation for sharing spectrum.”

Julie Napier Soller,
Deputy Coordinator International Communications and Information Policy (CIP) , United States Department of State , Spectrum for the Future

“Once they have ownership, they don’t share.”

Prasit Prapinmongkolkarn,
Emeritus Professor and Chair Professor, Department of Electrical Engineering , Chulalongkorn University, Thailand , Riding the Data Wave

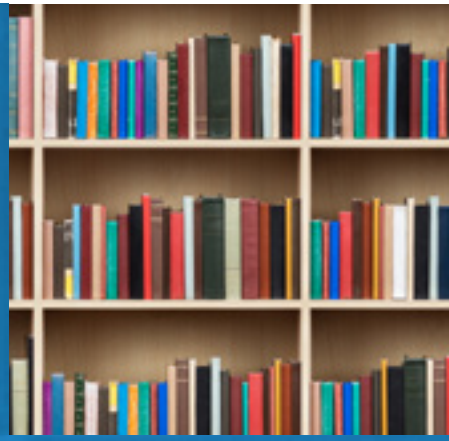
Regulation

Calling for modernization

The move to end-to-end IP-based networks and the rapid evolution in technologies, market players, consumer behaviour and services have left regulatory authorities stranded between the old world and the new. Regulation is necessary as never before to ensure the smooth working of the many aspects of the new ecosystem, yet inherently lags too far behind industry reality to be fully relevant. The highly dynamic environment of the Internet of Things, of converging vertical sectors and intelligent virtual networks will rely on smarter regulation and a more nuanced, holistic approach. Modernizing regulation means a radical rethink- focused on flexibility and facilitating growth via dialogue and collaboration throughout the ecosystem.

Regulation

> *“Regulation is not science. This is more like art.”*
>
> Wonki Min,
> Director-General, Ministry of Science, ICT and Future Planning of Korea, Convergence of Regulation



Traditional role

The twin roles of traditional regulation have been to protect both the consumer and the market. Working in the best interests of the consumer means ensuring choice, raising awareness of technology and preventing exploitation on price or service quality; and also, importantly, intervening on behalf of the consumer and the public good when and where the market fails, in particular through universal service funds and emergency services. Technology-neutral, transparent regulatory policies, including appeals process, settling interconnection disputes, compensation, balancing investment in infrastructure against competition, ensuring call quality and completion and overseeing spectrum allocation, enable fair, open competition to flourish.

Lagging behind the new realities

Technology, industry dynamics and consumer behaviour have evolved dramatically, leaving regulation lagging behind to an unprecedented degree. There has been a fundamental shift away from traditional packet-based voice models of tariffs and minutes to end-to-end IP networks with internet pricing structures, players and models. An explosion of over-the-top (OTT) companies offering services over the telcos’ networks have exposed a gaping disparity in regulation, with OTTs largely free from the strict regulatory controls within which operators must work on areas such as security, network integrity, data protection, universal service contribution and taxes. The ensuing distortion of revenue flows, from the operator perspective, leaves many telcos unable to see the return on investment in much-needed networks. The influx of OTTs has consolidated market reach in the hands of a limited number of major international players active in local and national markets, where there is a need to ensure alternatives for consumers and incentivize local innovation.

The cross-border, international flow and storage of data has created jurisdictional grey areas and regulatory uncertainty; the exponential growth of data, and the big data analytics accompanying it, has caused massive concern on privacy and security which cannot be addressed with present legal mechanisms. The volume and complexity of data will increase in manifold ways with the growth of M2M communication, eventually reducing the human aspect of connectivity to as little as 1% of the total, posing a regulatory rethink on effective frameworks at this scale. Regulation must also adapt in theface of software-driven services and dynamic provisioning reshaping revenue flows and models as network functions virtualization grows; and respond to open source innovation triggering debate on intellectual property, particularly at the edge of the network.

Regulation

“There needs to be a lot of business model flexibility. There needs to be a lot of regulatory flexibility and regulatory modernization that goes with that.”

Eric Loeb
Vice President, International External Affairs, AT&T, Regional Leaders Roundtable

Converging worlds

Regulating in the face of convergence is a central concern, as the fusion of ICTs and other industry sectors increasingly seek to create new, interconnected ecosystems. Technological convergence in broadcasting is already underway; telco-enabled vertical sector growth in areas such as smart cities, transport and healthcare is dependent on addressing current regulatory silos and introducing smarter, integrative regulation. This may take the form of facilitating convergence, playing an active role in convergence, or even the complex step of converging the regulatory bodies of different sectors; whichever course is taken, dependent upon individual market and sector, communication-speaking the language of the sector in question and overcoming cultural and functional barriers - is key.

Convergence of media and telecommunications over broadband is most pressing, bringing together at times competing telco, broadcasting and content interests. Protecting and empowering the consumer is complicated by the international nature of content, changing patterns of media consumption (from linear, appointment TV to on-demand, for example), and different degrees of regulation over different media. The lack of a level regulatory playing field is to the disadvantage of the network operators in particular; moves to abandon national terrestrial broadcasting in favour of using mobile networks highlight the urgent need to reestablish, or indeed abolish, cross-sector regulations and boundaries.

“Regulation is a different type of service that really calls for more of an enabling kind of agency-wide or government-wide policy.”

Jacquelynn Ruff,
Vice-President, International Public Policy and Regulatory Affairs, Verizon Communications, From Voice to Data to Cloud: Transitioning the Telco Business Model

“Don’t follow the old models. Old models are no longer appropriate. So think again.”

Alan Horne
Chief Executive Office, Broadband Pioneer , Convergence of Regulation

So in some ways, it's not just operator business models in danger of being obsoleted, the regulatory model may be just bypassed by a whole web industry.

Martin Geddes, Founder,
Martin Geddes Consulting United Kingdom,
New Opportunities in Voice and Messaging

Conversation is crucial

As regulatory bodies struggle to redefine roles and address the real issues of a vastly-changed industry landscape, dialogue, cooperation and collaboration are imperative. Talking to all the stakeholders and parties within the ecosystem enables regulators to understand competing needs, future technologies, roadmaps and strategies. Collaboration at an international level is important to compare best practice, allowing emerging markets in particular to leapfrog developmental stages and establish effective, modern regulation. It is also vital to deal with data flowing cross borders and the concomitant issues of intellectual property, convergence, global standardization and taking future-proof technologies to scale.

The biggest challenges, however, may be initiating successful dialogue between vertical sectors and the corresponding regulatory bodies to enable convergence, and its benefits, to flourish.

Convergent technology does not mean you must have convergent regulation.

Suthiphon Thaveechaiyagarn
Commissioner, NBTC, Thailand,
Convergence of Regulation

Should we be radically thinking of how we regulate the industry when media, voice, radio, TV, is coming over the broadband pipes to our homes and to our smart devices?

Alan Horne
Chief Executive Office,
Broadband Pioneer, Convergence of Regulation

Big Data

Derailed by the failure of trust?

Big data is upon us like a genie out of the bottle: unimaginable quantities of data released by an explosion in fast computing, low-cost storage and processing, extending well beyond ubiquitous smartphones and social networking to the growth of machine to machine (M2M) technology connecting billions of devices in the Internet of Things. Making that data actionable, releasing its value as the future primary driver of the economy, promises enormous societal benefits and huge commercial opportunity. It also threatens individual rights to privacy, national security, our definitions of justice and the very fabric of society. Legislation, regulation and best practice must be adapted to balance benefits and dangers , secure collaboration to stimulate connectivity- and let the data flow for meaningful purpose.

Big Data

> *“The core economic point about big data is that the value of data is not exhausted or reaped by just using it for the purpose that data had been collected for.”*
>
> Viktor Mayer-Schönberger,
> Professor of Internet Governance and Regulation,
> Oxford Internet Institute, Protecting the Individual in a Growingly Connected World of Big Data

Actionable data

Big data is massive and highly-complex raw data , transformed by human intervention (or artificial intelligence) in the form of analytics into valuable, actionable data. Data must not only be collected, but also formatted, curated, stored, analyzed and reanalyzed to release its value, relying on the fusion of computing and network technologies. Its core economic potential lies in its reuse beyond the original purpose of which it was collected, for a multitude of further purposes unforeseen- and unforeseeable- at the original time of collection. Big data knows no boundaries and cannot be compelled to respect any one jurisdiction, raising issues of security and privacy in a globalized digital and cloud-based economy. For all its promise, monetization models and revenue flow- the winners in the world of big data- are not yet clear.

Benefits and threats

Big data holds tremendous promise to transform business and political perspectives, creating better work processes and driving economic growth. Its immense positive social impact will enable pressing public policy objectives to be met, saving lives in emergency situations (such as locating citizens and refugees in the aftermath of a natural disaster) ;and managing data intelligently for better quality of life; supporting sustainable and economically-efficient services and utilities in smart cities ; and offering greater convenience and improved services for consumers in daily life. But the growth of big data may be impeded by obstacles and fears of its potential risks to society. The rise of predictive analytics may lead to punishment or restriction based purely on propensity to commit a crime, removing freedom of choice or circumstance and leading to a redefinition of justice. Favouring the correlated trends of big data endangers established scientific methods, and risks the abandonment of casuality for correlation and potentially self-reinforcing beliefs. Development will be stalled without government and regulatory policy in areas such as spectrum availability, privacy concerns and facilitating the adoption of big data-driving IPv6 and M2M technologies. Industry may lose out if user data collected over the network is repurposed by third parties (including government agencies) without additional payment to operators; disputes over big data revenue could extend beyond the telcos to become a contentious trade issue.

Big data

Failure of trust

The biggest single threat to realizing big data's potential remains the breakdown of trust. Fears of data abuse, loss of privacy and security could seriously stall the growth of a new industry. Privacy is a concept that varies in nature across cultures, societies and generations, making standardization and legislation tricky; but the widely-held view of personal data as individual property may be unhelpful, if not unrealistic, in the world of big data for the common good. Many current privacy policies are largely meaningless, written in complex, formulaic, lengthy documents which are rarely read, and are unenforceable in the global, cross-jurisdiction flow of big data.

There is a fundamental tension between consumers giving consent for use of data for a given intent at the point of collection, and unknown, multiple future uses of that data that will release its true value but potentially threaten privacy. Benefiting from the convenience of apps, information and entertainment involves a certain pragmatic surrendering of privacy. Consumers remain often unaware of the basic architecture of smartphones and apps, designed to disclose data by default; or indeed of the fact that three or four data points brought together can destroy the myth of anonymized data.

"Invest in security and privacy frameworks rather than faster networks!"

Gerd Leonhard,
Futurist and CEO, The Futures Agency,
Futurist Keynote

> *“Big data is inevitable but what hasn’t caught up is how people react to it and control it.”*
>
> Charles Brookson, Director, Azenby, Big Conversation - Big Data: Opportunity or Threat to the Fabric of Society?

Frameworks of privacy and trust

Establishing privacy and legal frameworks is vital to secure trust and enable big data to grow. The first step is to improve consumer awareness of the realities of technology, and of that pragmatic balance between services and security, to create trust based on reasonable expectations. Data will flow across international borders, shared with multiple parties who will not and cannot be expected to ask for consent in each case; there is currently a basic inability to provider granular detail on secondary (or further) uses of data; but there is an opportunity to differentiate use of data dependent on its nature, from the strictly private retained for its primary purpose, to permission-based third party use or automatic, anonymized sharing for public purpose.

This transparent approach to establishing trust should enable the user to make meaningful choices on products and services dependent upon context. It should be accompanied by widespread consumer awareness of the importance of basic privacy measures such as security settings and strong passwords, in advance of upcoming improved technologies in the identity space, from digital certificates to crypto technology.

There is an urgent need for a nuanced concept of reasonable and legitimate use of data in context across the ecosystem, based on commonly-accepted common sense obligations as to when consumers should be notified of secondary use of data. Best practice privacy guidelines for app developers, processes and policies for self-regulation within the industry, and forums for multi-stakeholder dialogue should form part of a new social corporate contract on the reasonable use of data, ethics, standards and clarity of privacy policy. (Self-) regulation must be backed by a practical and enforceable legal framework which reflects the new, open and cross-jurisdictional reality. The aim should be to establish an ecosystem of accountability in terms of responsible data use, to encourage freedom of expression, letting the value of data flow and the industry grow.

Big data

Making money

Operators are ideally positioned to benefit from the big data boom, running networks collecting vast amounts of data for certain purposes (notably customer relationship management and billing), data which could be licensed to third parties or applied to innovative ends. The traditional disadvantage of a regulatory straitjacket could be transformed into a competitive differentiator, as consumer perception of telcos as a trusted platform could enable operators to become a gateway for data sharing. Premium privacy products and services could provide a new revenue stream, as could enabling consumers to control their personal data as a product or within the quantified self concept. Accessing and using big data in the back office will provide real time analytical capabilities to improve internal processes and ensure a better customer experience, in particular through the individualization and personalization so characteristic of the digital economy.

Operators may invest in new in-house big data products such as predictive behavioural models or in-depth data mining to filter in (rather than out) information surrounding voice calls and services. The two biggest areas of opportunity, however, remain working with the enterprise market and with government. Ensuring enterprise clients are aware of the value of big data analytics made possible M2M and the Internet of Things should enable the industry to position itself well on the emerging value chain. As both a major user and producer of big data, in particular with regard to smart cities and utilities, government may be the telco industry's best partner in making good on the lure and promise of big data.

"It's about ensuring that all those that participate in this digital revolution take their own responsibility. Consumers are not just signing up for everything.. corporate businesses taking corporate social responsibility and governments putting in place the necessary framework to allow this industry to grow, but safeguarding interest of the consumers."

Adriana Nugter,
Independent Advisor,
How can World Citizens Ensure their Privacy

“We’re at the balance between society’s needs and the rights to privacy of individuals.”

Patrick Walshe
Director, Privacy, Government & Regulatory Affairs, GSMA, How can World Citizens Ensure their Privacy in a Digital World?

“Legislators are trying to write laws on privacy, on big data and how to protect it...yet those things will change within hours, days, minutes as networks and information grow. Industry and government have to work together to put in sensible controls.”

Charles Brookson, Director, Azenby, Big Conversation - Big Data: Opportunity or Threat to the Fabric of Society?

“The power of technology exceeds the scope of our ethics.”

Gerd Leonhard,
Futurist and CEO, The Futures Agency,
Futurist Keynote

“One route for success economically is relying on trust rather than selling out to big data.”

Viktor Mayer-Schönberger,
Professor of Internet Governance and Regulation, Oxford Internet Institute,
Protecting the Individual in a Growingly Connected World of Big Data

Models And Markets

Adapt or die

Telcos need to change mindsets and operational models if they are to survive. New market realities, technologies and consumer behaviours require revolution, not evolution. End-to-end IP, the arrival of IT in the network, growing numbers of new players offering over-the-top services, the explosion of mobile, social media, cloud services and data have utterly transformed the game. New models, services and revenue streams are needed to cover investment in next generation networks as core voice income falls away. It's about finding a way to exploit the operators' core assets of customer base and network, whether focusing on access or services, alone or in partnership, with enterprise, consumer, vertical or government sectors- and how to make it earn.

Models and markets

“So the future is IP merging with IT and IT merging with IP.”

Gabrielle Gauthey
Executive Vice-President for Global Government and Public Affairs
Alacatel Lucent, Telco and OTT

Core strengths

There are several broad approaches to leveraging the traditional core operator strengths and expertise. Improving the central operational business may focus on running the networks as the heart of telco business, or focusing on customer relationship management. Fundamentally redefining the business model on the basis of customer needs, experience and adoption to create new user services may prove difficult as it is outside operators' comfort zone and skill set; finding a unique selling point and building services only where there is a clear need or value-add is vital.

Virtualization, M2M

Monetizing access by providing differentiated quality of service fit for context, purpose and end user market segment is greatly enabled by network functions virtualization. Merging IP in IT-based networks provides operators with a platform for an ecosystem of new services, features, apps and app development, with dynamic provisioning to meet peak demand, align costs with the usage consumption model and offer the flexibility to purchase elements as and when needed. Telcos may also act as hosting companies, outsourcing IT services to operate across the network, including multiple virtual network operators serving specific markets or vertical sectors. Offering wholesale network capacity and core functions to companies without assets or knowledge base opens up the B2B operator-for-operators niche.

Connecting trillions of unconnected devices, to each other, the internet and to humans, machine-to-machine communications (M2M) and the Internet of Things offer enormous opportunities. Rendering the data generated by an almost unlimited number of devices actionable is the job of big data analytics; ensuring sufficient unique addresses to make it future-proof involves wide scale promotion of IPv6. The Internet of Things will create a huge and valuable ecosystem of power, connectivity, sensors, computing, network gear, services, data analytics solutions, hardware, middleware and applications. Operators must position themselves clearly within the new value chain, seeking investment and partnership with government and industry sectors, or risk losing market space in the digital world to other industries.

It may be too early to define business models on the consumer side, where smart home devices have no profit margin and value is not clearly perceptible. A more wholesale approach focuses on collaboration with government and public sector utilities as the big beneficiaries of smart services. The Internet of Things integrates sensors globally into multiple subsystems, enabling the real deployment of smart cities and smart vertical sector solutions with scale benefits on cost saving, efficiency and sustainability. The technology is ready; the challenge lies in managing the intersection of discrete industries, cultures, and languages, breaking the silos of government ministries and modernizing regulatory frameworks.

Models and markets

Embracing the OTT challenge

Over the top (OTT) services over operator networks threaten telco relevance and revenue-and as internet, telco and IT converge, OTTs are moving into the network space. Attempts to block OTTs and establish the regulatory status quo are unlikely to succeed. Collaboration is more constructive, offering a platform with guaranteed quality of service, access to customers and the skills to run complex infrastructure. Operators may compete directly by developing content and services in-house or buying in expertise through acquisitions or mergers; a truly disruptive model is that of thousands of local networks in silos acting as points of access to the global internet. Hybrid models and partnerships are perhaps most likely to succeed.
Any new services must provide value to the end-user. Advanced network technology enables operators to drop the concept of one-size-fits-all, supply-based provision of quality, support and security- moving instead to the flexibility of multiple products differentiated on customer experience, quality of service, extent of customer support, data privacy and service level agreements, dependent on end user context, intent, needs and relative cost.

"My view is the value in whether it's voice or messaging is not about minutes or messages, it's about why you are making that call and what you would do with the information afterwards. It's intents and purpose, not transport."

Dean Bubley,
Founder & Director, Disruptive Analysis,
Telco and OTT

> *You need more technically competent people on the [telco] board. A lot of the board members of telcos are accountants and apparently economists.*

Neil Davies,
Founder & Chief Scientist, Predicatable Network Solutions, Mobile Cloud Networks

Digital support systems

The digitalization of back office support services can be exploited in new models and products. Vertical sector integration with communications and IT involves process, support systems, logistics and customer relationships, not just technologies and solutions. Dynamic allocation over IT-based networks, run from the back office, provides granular slices of network according to need and capacity. Opening up the digital back office to third parties as a commercial model offers network and connectivity, customer support or individual services such as operator billing. Customer satisfaction is the great competitive differentiator; big data analytics in operational support systems can provide real time charging, unified customer models and valuable personalized services. The combination of unstructured data and real time analytics will generate additional products and revenue, improve customer experience and streamline internal processes.

> *If telco is going to win the battle against OTT, you have to behave like them. If you want to catch a thief, you have to be a thief.*

Andy Abramson,
Founder & CEO, Comunicano Inc,
Telco and OTT

> *The real answer for telcos is not to combat but to work with the OTT organisations as partners.*

Peter Mercieca,
Partner, Technology Media & Telecommunications, KPMG,
Mobile Technology and Productivity in the Enterprise

Models and markets

New opportunities in voice and data

Migrating to richer, IP-based real time communications will provide a range of next-generation voice products, threatening to oust the traditional pillars of global ubiquity and interoperability with thousands of hyper-personalized, context-specific services based on consumer demand. Value-added services include WebRTC, embedding voice in general consumer and enterprise apps, and hypervoice advanced services integrating voice into other services as a digital object which can be searched, analyzed, tagged, archived and aggregated. Emergency calling and basic voice telephony may remain as lowest common denominator services.

Operators may be well-positioned to benefit from established customer relationships and the perception of telcos as a trusted, highly-regulated industry when defining business models in the emerging big data economy. There is scope to explore in-house data products, differentiating on sector, generation and context; to partner with vertical sectors on smart solutions; to sell data to third party retailers; and to market trust as a product, in particular through local data centres.

The enterprise market has great potential for both big data and voice products, investing at scale where a clear business case for return on investment can be made. Technology can improve productivity and processes in enterprises, monitoring BYOD usage, billing and security, in addition to bespoke bundles of cloud services, video capabilities and hosting.

> *“It’s not easy but I think one of the things that’s important is for regulators to understand in the past there’s been one or two products and in the future there’s going to be hundreds or thousands and it’s not going to be possible to regulate all of them and they’re all going to look very different, so how do we go from the two product world to the 2000 product world.”*

Martin Geddes , Founder,
Martin Geddes Consulting United Kingdom,
New Opportunities in Voice and Messaging

“It’s about trying to secure the network of the future to be relevant and be able to cater for different requirements on the network. In the future every device or everything that can benefit from being connected will be connected--and you’ll have a lot of very different requirements from all those devices and virtualization. So we have to secure the networking to be a more dynamic, flexible, automated platform.”

Jan Ellsberger,
Director, Network Technology Strategy,
Ericsson, Network Virtualization

Innovate

Telcos must innovate to avoid losing the initiative to device manufacturers or app developers, changing culture and mindset to reinvent, augment, transform or substitute. Open innovation, investment in small incubators and start-ups, innovation ecosystems through small internal units or hubs- all are important ways to structure innovation, but changing management structure and process to accommodate the agile, swift-to-market nature of innovative projects and pilots is critical. Emerging markets offer a key space for innovation, new businesses and sectors; every organization and market requires its own strategy aimed at local market needs and conditions.

“More and more consumers are realizing if it’s free, it’s not really free. That, in fact, you are the product.”

Teresa Corbin, Chief Executive Officer,
Australian Communications Consumer Action Network (ACCAN), From Voice to Data to Cloud: Transitioning the Telco Business Model

“The shocking part is that this whole area is really bringing together telecoms, the whole internet domain and the whole OSS and IT world, that means you have to bring together a really big mafia, which is very complicated and will take a while.”

Thomas Magedanz, Head of NGN Division , Fraunhofer Institute FOKUS, Network Virtualization

Mobile Futures

Taking over the world

Running parallel to the shift from voice to data has been the move from fixed to mobile. The vast majority of broadband access globally is now mobile, in particular in emerging markets where fixed networks are prohibitively expensive and impractical. Explosive and unpredictable, shaped by the growth of new apps, devices, content and players, the mobile market promises more disruption and opportunity- including the emergence of mobile cloud networks, and the increasing fusion of mobile and internet.

Mobile futures

Ongoing disruption

Mobile communications are personal and powerful. Mobile devices accompany users everywhere, all the time, serving as the centre of all social networks, highly-personalized, and offering convenience, ease of use and massive computing power in the pocket. The disruption caused by the fundamental change in scale and the internet platform shift from desktop web to mobile devices will continue, with market players, content, devices, consumer behaviour and the entire value chain in flux. There is no single model for mobile telephony, but many opportunities in advertising, content, location and voice prediction services. The barrier to entry for apps developers is very low, and the potential for industry-wide disruption very great.

Opportunities

Mobile operators must focus on exploiting networks and customer relationships as a competitive advantage, adding value rather than blind copying or producing apps for apps sake. Services and apps should be relevant to local markets, with defined customer benefits matched to local consumer spending power, demographic, choice of device, needs and perceived value. The enormous potential of emerging markets will refocus priorities in design, devices and business models. Operators may play a utility role in the market, leaving apps to established professionals in a crowded field; or partner with content, media and app creators to develop competitive consumer services; bundle services with third party apps, resell apps or even build operator app stores offering local-language, locally-relevant services.

Other models include walled garden or security apps to eliminate risk, offering third parties the option of engaging in services paid for by prepaid SIM cards and using messaging functions for value added services such as password reminders and authentication. Using the customer base in partnership with OTTs may open up advertising (targeted and relevant for free content only) and subscription services.

“It is only telecommunication providers that own the data centers and the networks. If they combine it, they can offer a new platform for application developments that has clearly a value, the network being integrated.”

Thomas Michael Bohnert,
Senior Research Scientist,
Zurich University of Applied Sciences,
Mobile Cloud Networks

Mobile futures

Digital back office

Advanced IT networks in the digital back office will allow for capacity utilization, dynamic allocation and segregation at granular level, driving segmented services on price, quality and operation support systems. Big data analytics in the back office offer real time analytical capacity to create better consumer products and services, in particular with the mobile broadband device as an always on, open portal. Services to the enterprise market include monitoring personal and business use in BYOD, focusing on productivity and measurement, and detailed business insights and analytics to an unprecedented degree. Telcos may also evolve systems integration features, offering back office support to third parties on processes, customer relationship management and billing; or collaborate with front-end partners such as app developers and device manufacturers to grow mobile digital commerce.

"A mobile-first approach to business processes and design can take the user experience to another level inside the enterprise and solve real business problems. Mobile interfaces provide detailed insights and analytics never before seen on any device or interface."

Chris Gabriel
Former CEO, Zain Africa,
Mobile Technology and Productivity in the Enterprise

"The future of the telcos is most likely not communication service."

Thomas Michael Bohnert,
Senior Research Scientist,
Zurich University of Applied Sciences, Mobile Cloud Networks

"The challenge is to find the service that actually makes sense to come from a telco."

Oscar Veronese
SVP Asia, InternetQ,
The Social and Mobile App World: Friend or Foe?

“It’s about restoring trust currently. I think that will take a lot of effort to do that.”

Latif Ladid,
Founder & President, IPv6 Forum,
Mobile Cloud Networks

In the cloud

Mobile cloud networks combine mobile communications with computing to run network functions in the cloud, enabling new business models at the inflection point between mobile and internet technologies. Running mobile network functions in the cloud reduces costs, and provides elasticity, scalability, on-demand provisioning, calibration and better performance. Operators need to invest in research and human capacity, innovating to create value in-house on this new platform, developing new apps and protocols without being locked in to equipment manufacturers. The time to do so is now, to avoid the risk of losing market space as cloud computing providers begin to move into networks- the fusion of telecommunications and IT is not a one-way street.

Placing the majority of functions in the cloud enables cost saving and increased capacity from sharing physical infrastructure for essential requirements. Creating in-country clouds based on local data centres may meet concerns on data privacy and security, offering local services and expertise; less sensitive services and infrastructure can be pushed out to more cost-effective global cloud services. The mobile cloud will move on from the legacy mentality of one size fits all to the flexibility of multiple virtual mobile operators (subcontracting or leasing the network) for specific types of traffic, in particular in vertical sectors. Processing sensor information in the cloud will reduce information density from the huge number of future M2M sensors, enabling efficient deployment of interconnected smart sensors in the Internet of Things.

For the mobile broadband ecosystem to flourish, open dialogue with regulatory bodies is essential, in particular on spectrum allocation, network infrastructure sharing, heterogeneous networks, and mixed technologies such as wifi offload, small cells, and fibre backhaul.

“The amount of money you need to completely disrupt the telco business, it has collapsed.”

Robbie Hills,
Head of Media Technologies - China, South East Asia & India, Google, Social and Mobile App World

“Today we’re still in the lull of one size fits all for communications. With the increase of machine-to-machine, the specific part of data we can have in the multiple machine-to-machine applications, you can foresee that you will have virtual mobile operators and virtual operators for any specific type of traffic. I think you will find value in the business models specific for this kind of thing.”

Latif Ladid,
Founder & President, IPv6 Forum,
Mobile Cloud Networks

Education Transformation

Invest in training the teachers

Transforming the current delivery, content and structure of education by transitioning to digital education will improve the reach and effectiveness of educational programmes throughout the world, providing the 21st century skills and tools to sustain industry and national growth in the digital economy. E- education will take not place in any meaningful form without the long-term commitment and vision of government to overhaul the entire educational ecosystem, dealing with complex multiple stakeholders from industry to educational professionals, funding, content, infrastructure, devices, parents and students. But the biggest obstacle to success is resistance from the teaching profession, stemming from the perceived threat of loss of power, role or value in the unfamiliar digital culture.

Education transformation

Government commitment

Education transformation requires vision, leadership and commitment from government, investing in its population as a vital natural resource by establishing a sustainable long-term national digital education strategy. This involves collaboration across government ministries, in particular education, ICT and finance, to promote awareness of the wider socio-economic benefits of e-education, allocate funding and overcome internal political or bureaucratic hurdles. Establishing a national ICT connectivity architecture focused on educational institutions in both rural and urban areas can best be effected through public private partnerships with local and multinational industry players on infrastructure, devices and content. Government must also make a compelling case for the benefits of digital education to the teaching profession, parents, students and wider public.

“The problem is, the teacher thinks that because they don’t know technology, they don’t have value as a teacher.”

Mario Coronado, Director, Fundación Telefónica del Perú, Education Transformation: from Vision to Action

“The kids grow up with computers. Maybe the teacher didn’t. They need the confidence. They need the training.”

John Davies, Vice President, Intel World Ahead Program, Intel Corporation, Education Transformation: Importance of ICT in the 21st century classroom

“Education for all only can be realized if you have Internet for all.”

Ahmad Shabery Cheek, Minister, Ministry of Communications and Multimedia, Malaysia, Education Transformation: Importance of ICT in the 21st century classroom

Education transformation

Overcoming teacher resistance

Implementation of e-education requires a government-driven, wholesale approach - but without the buy-in of the teachers as key stakeholders, success at scale will remain elusive. There is a need for a huge conceptual shift for the teaching profession, a cultural migration from traditional, analogue pedagogy to the digital education mindset. Children and students as digital natives are already there; the impact of digital delivery in and outside the classroom is huge. But for many teachers, e-education is at best an unnecessary distraction, and often a frankly frightening prospect, threatening a fundamental loss of personal and professional value. Teacher resistance is the biggest single barrier to education transformation; overcoming this human issue, making educators comfortable and confident with an entirely new approach to their profession, remains the greatest challenge.

It is vital to articulate a clear and sustainable national plan for digital education, communicating the value proposition, offering incentives and recognition for teachers to engage and seeking teacher ownership of the digital classroom. Continuous professional development must provide training, support, fit-for-purpose ICT skills and understanding of the key differentiators of digital pedagogy such as personalized learning plans and the use of social networking.

> *"When you bring a computer to the school, the teachers are excited. When you bring a computer into the classroom, they're delighted. When every child in their class has a computer, they're terrified."*

Brian Gonzalez, quoting Alicia Banuelos, Vision to Action, Director, Global Education Programs, Intel Corporation, Education Transformation: from Vision to Action

Content and funding

Engaging, rich and relevant digital content is crucial, including assessment and analytics alongside the curation of local and personalized content from diverse sources. Personalization is the defining benefit of digitalization, offering the flexibility of individually-tailored content supporting different learning types. Highly-local content can be self-generated or co-created by students and teachers, or drawn from local applications developers and open education platforms. Social media enables peer-to-peer learning, sharing best practices, support and content endorsement throughout teaching communities, locally, nationally and globally. Curriculum and content are being aggressively digitalized, but the tipping point will only be reached when the majority of material is published in purely digital format.

Funding such an immense transformation encompassing infrastructure, devices, professional development and content requires creative policies and partnerships. Possibilities include channelling universal service funds specifically into connectivity to support educational transformation, tax exemptions or subsidies on devices and collaboration on loans with international institutions, regional and national banks, including micro-financing for end-users. A wide range of collaborations with industry and community experts, civil society organizations and universities should focus on encouraging as commercial an approach as possible through the private sector to deliver change as efficiently as possible. Corporate social responsibility can be aligned with business priorities, given that education is essential for providing the skilled workforce the industry depends upon; private sector service providers and content developers can be guaranteed not only student subscriptions, but privileged access to new ancillary markets in local families and communities.

“If you think education is expensive, try ignorance.”

Tim Unwin,
Secretary General, Commonwealth Telecommunications Organisation, Education Transformation: from Vision to Action

Education transformation

No internet, no digital education

Connectivity and access to affordable devices in schools are fundamental. Focusing on schools and universities as central hubs for national fibre optic backbone infrastructure, private sector partnerships energy and mobile broadband infrastructure (as the biggest driver of connectivity in many markets), and innovative spectrum sharing are important measures. Standardized technology and devices will drive scale and lower costs; BYOD schemes and tablets enhanced with user-friendly apps are often more effective than laptops. Developing nations may have the best chance to use a clean slate and lack of extensive legacy in ICT or educational structure to leverage the benefits of digital education and leapfrog socio-economic development. But the challenges in emerging markets are significant: reaching rural, remote and under-populated areas with broadband services, developing sufficient human capacity and not exacerbating urban-rural inequality or allowing the digital divide to deepen into an educational divide.

“(Education transformation) is fundamentally about enabling teachers to make transformation.”

Tim Unwin,
Secretary General, Commonwealth Telecommunications Organisation,
Education Transformation: from Vision to Action

“We have been saying that we need to invest in training and equipping the teachers for the digital classroom for more than a decade, and it still hasn’t happened. That takes pedagogy as well.”

Tim Unwin,
Secretary General, Commonwealth Telecommunications Organisation,
Education Transformation: Importance of ICT in the 21st century classroom

Further information and sources

All the content within this report, including all the quotes is drawn entirely from the interactive panel debate and discussions that took place at ITU Telecom World 2013 in Bangkok, Thailand. It is also available via a dedicated ITU Telecom World 2013 outcomes microsite, which can be viewed at telecomworld.itu.int/outcomes/2013/ All the sessions can also be viewed as video-on demand at telecomworld.itu.int.

Our heartfelt thanks to the government of the Kingdom of Thailand, the hosts of ITU Telecom World 2013. Our sincere thanks are also due to all of our event participants for their dynamic, insightful and invaluable contributions to the debate and interactivity before, during and after the event. We look forward to continuing the conversation as we head toward ITU Telecom World 2014, which takes place from 7-10 December in Doha, Qatar.

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ITU TELECOM WORLD '13
Bangkok 19-22 November

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March 2014