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Regulation for digital transformation

Celebrating 20 years of evolving regulatory frameworks

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Regulation for digital transformation

Houlin Zhao

ITU Secretary-General

■ The 20th edition of the Global Symposium for Regulators (GSR-20) came at a time when the role of the information and communication technology (ICT) regulator and policymaker took centre stage in the response to, and recovery from, the COVID-19 crisis.

An initial ITU response to the crisis that focused on the role of regulators and policymakers was the creation of the Global Network Resiliency Platform (REG4COVID), a tool to help our membership address the unprecedented demand faced by communication networks. Since then, REG4COVID has become a place where ICT regulators, policymakers and stakeholders from all over the world can share best practices and lessons learned.

Collaborative regulation has been steadily gaining momentum, reflecting a data-driven world where the demarcation between the ICT sector and

other industries has become increasingly blurred. ITU has experienced this digital transformation first-hand, with new players active in different sectors of the economy joining our organization and becoming an integral part of our deliberations and discussions.

It became even more evident at this year's GSR, that regulators and policymakers must work with investors, including operators, to create the conditions that encourage the investment that will meet the needs of the unconnected, providing more connectivity but also more security, better digital skills, and improved affordability of ICT services.

At stake is economic growth, job creation, innovation and a safer more sustainable world for all.

I am pleased to present you here the ITU News Magazine highlighting some of GSR-20's outcomes and discussions. ■



“The 20th edition of the Global Symposium for Regulators came at a time when the role of the ICT regulator and policymaker took centre stage.”

Houlin Zhao

Regulation for digital transformation

Celebrating 20 years of evolving regulatory frameworks



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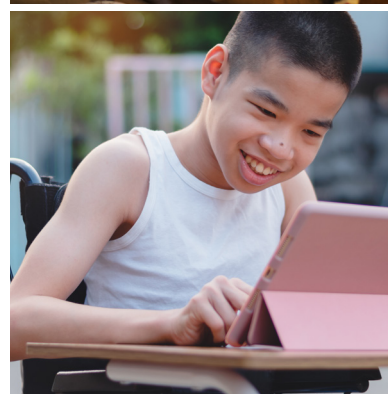
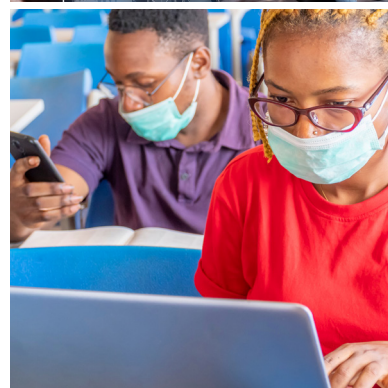
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Best practices for regulators and policymakers in digital regulation for “building back better”

By Doreen Bogdan-Martin

Director of the ITU Telecommunication Development Bureau

■ In the wake of the COVID-19 crisis, the work of regulators and policymakers in the digital ecosystem will be critical in building back better.

This is why, in these uncertain times, I believe that the [GSR-20 Best Practice Guidelines: The gold standard for digital regulation](#), developed during this year’s Global Symposium for Regulators ([GSR-20](#)), represent an extremely important roadmap in our increasingly digital world.

Embodying gold standard fifth-generation principles, our regulatory guidelines stress flexible, agile, light-touch regulation that is collaborative and open to participation.

Our information and communication technology (ICT) policy and regulatory frameworks need to be fit-for-purpose. They need to be up-to-date, flexible, incentive-based and market-driven to support digital transformation across sectors, and across geographical regions. In short, they need to leverage the power of digital platforms and infrastructures to build the resilience we need to protect us against future global emergencies.

Ground covered at GSR-20

We covered so much ground during GSR-20 about how to be fit for purpose and strengthening collaboration. We took a deep dive into competition issues, spectrum, safety, security, sustainable and inclusive societies.



“
In the wake of the COVID-19 crisis, the work of regulators and policymakers in the digital ecosystem will be critical in building back better.
 ”

Doreen Bogdan-Martin

At the opening of the event, I spoke of regulators as the architects of the project to bridge the digital divide. But I think the rich and vibrant discussions over the three-day event convinced me that I probably underestimated their role.

In our post-COVID world, digital is going to define every single aspect of our new normal. The role of GSR regulators could hardly be more critical.

I reiterate GSR-20 Chair, Dan Sjöblom, Director-General of the Swedish Post and Telecom Authority (PTS) and Chair of Body of European Regulators for Electronic Communications (BEREC), when he said that “as the pace of digital transformation accelerates, developing an effective regulatory approach is more vital than ever.”

GSR-20 was indeed extraordinary – we saw an unprecedented level of participation on the virtual platform, with over 600 experts joining throughout the week from 120 ITU Member States and 73 ITU Telecommunication Development Sector (ITU-D) Members.

“

Our regulatory guidelines stress flexible, agile, light-touch regulation that is collaborative and open to participation.

”

Doreen Bogdan-Martin

A series of events was held over the summer, starting with the Leadership Debate on 30 June, rich discussions at GSR-20 Regional Regulatory Roundtables in the different regions, and training co-organized with the United States Telecommunication Training Institute (USTTI) on 27 and 28 August.

Best Practice Guidelines proposed reforms

The GSR-20 Best Practice Guidelines propose the following reforms, in particular in light of facing unexpected events and emergencies and delivering up to expectations despite the odds:

- **Agile framework for competition in digital markets:** Regulators should support innovation and new business and licensing models that facilitate affordable access to and investment in health, enterprise, and educational services on digital platforms.
- **Codes of conduct (voluntary or enforceable):** Regulators should guide digital platforms and support them throughout the process of creating codes, their implementation and enforcement in important areas, such as online content moderation on digital platforms, addressing misinformation and online news quality, and child online protection. Media and digital literacy and awareness efforts should likewise be central to navigating the challenges around services that are enabled by the digital transformation.
- **Upgrading national emergency plans:** Creation and implementation of effective emergency plans enables better preparedness and decision-making during crises.

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We covered so much ground during GSR-20 about how to be fit-for-purpose and strengthening collaboration.

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Doreen Bogdan-Martin

Such plans are key to anticipating future unexpected events and their negative impacts and they should focus on both urban and rural areas through a multi-technology approach. Bilateral, regional and international cooperation should ensure business and public service continuity and underpin national recovery efforts.

- **Spectrum reform:** Spectrum managers need to be able to respond in a timely manner, making spectrum available for wireless applications when and where they are needed, and as easily as possible, giving spectrum users and innovators flexibility to provide services that will deliver the greatest benefits.

Ensuring that sufficient unlicensed spectrum is available drives innovation and investment in a range of technologies that can complement and support networks and expand broadband access at low cost. Spectrum reform should also be focused on ensuring that access to broadband services is provided affordably to those areas and populations that have been traditionally unserved or underserved.

Looking back two decades

This year GSR turned 20. For two decades, GSR has played a central role in helping regulators get to grips with the burning issues that keep them awake at night – issues such as evolving digital taxation frameworks, infrastructure sharing strategies, consumer trust issues, the blurring of demarcation lines between content development and network operation, network investment issues, and digital inclusion.

Every year since 2003 at the Global Symposium for Regulators (GSR), regulators have adopted a set of Best Practice Guidelines.

My team and the whole of ITU remain fully engaged with our partners as we work to support one another through the challenging and exciting times ahead.



20 years of GSR Best Practice Guidelines

Do you remember what concerned you 20, 10, or even 1 year ago?

Watch this [video](#) for a look back over the greatest milestones of the past two decades.



20 years lighting the way for telecoms regulations



| 2000 | GENEVA

Launching the dialogue among regulators



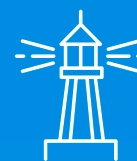
| 2001 | GENEVA

Effective regulation



| 2002 | GENEVA

Regulating for end-users



| 2003 | GENEVA

Universal access



| 2004 | GENEVA

Promotion of low-cost broadband and Internet connectivity



| 2005 | HAMMAMET

Spectrum management to promote broadband access



| 2007 | DUBAI

Next-Generation Networks (NGNs) migration



| 2008 | PATTAYA

Infrastructure sharing



| 2009 | BEIRUT

Innovative regulatory approaches in a converged world



| 2010 | DAKAR

Designing, building out and managing open access networks



| 2011 | ARMENIA CITY

Broadband deployment, innovation and digital inclusion



| 2012 | COLOMBO

Access to digital opportunities through cloud services



| 2013 | WARSAW

Evolving roles of both regulation and the regulators



| 2014 | MANAMA

Consumer protection in a digital world



| 2015 | LIBREVILLE

Targeted regulation to foster mobile applications and services



| 2016 | SHARM EL-SHEIKH

Digital financial inclusion



| 2017 | NASSAU

Incentives for affordable access to digital services



| 2018 | GENEVA

New regulatory frontiers to achieve digital transformation



| 2019 | PORT VILLA

Fast forward connectivity for all



| 2020 | ONLINE

Regulation for digital transformation

GSR: The regulator-first venue

ITU News connected with Dan Sjöblom, Director General of the Swedish Post and Telecom Authority to ask him why this year's GSR – the 20th edition – is so important.

Sjöblom also serves as Chair of the Body of European Regulators for Electronic Communications (BEREC) for 2020.

Why are GSR annual events important?

Dan Sjöblom: GSRs are important every year, because they represent one of the best opportunities for information and communication technology (ICT) regulators worldwide to have an open dialogue in a safe environment about what works well – and what does not.

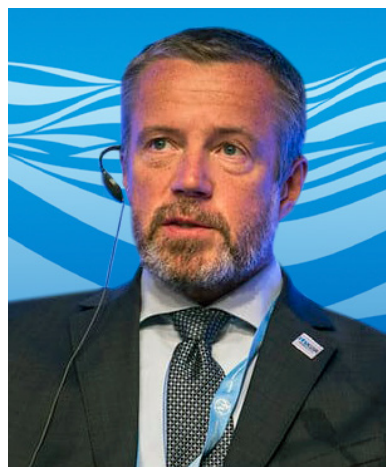
In our rapidly changing industry, we have seen the pressing need to work across industries and across borders to continuously recraft the regulatory environments that best allow critical ICT investment to flow. Otherwise, we cannot properly unlock the power of ICTs to improve lives.

There are other more industry-focused events to exchange best practices and hear from regulatory affairs representatives of key new and traditional ICT players. But GSRs are the regulator-first venue for us to focus on how to work better together.

The COVID-19 crisis has made these issues so critical, so essential.

The situation demands that we learn from each other in real time. GSR-20 offered one of the best opportunities to do so.

I don't remember a time when government leaders were more receptive to how regulatory innovation can help them better leverage ICTs to get economies and societies back on track – and to "build back better" after COVID-19.



“GSRs are the regulator-first venue for us to focus on how to work better together.”

Dan Sjöblom

How has Europe transformed its ICT regulatory approach over time? What are some of the key elements?

■ **Dan Sjöblom:** Europe started its voyage towards competition and liberalization in the late 1980s, with the new regulatory framework in the early 2000s and has been evolving ever since.

The new Commission has given great importance to digital transformation. The regulatory framework is founded on the competition principle and a belief that all regulatory measures implemented should have promotion of competition as a basis.

Regulation in itself will not lead to the desired targets but it can create the right prerequisite for innovation and investment, by creating a stable and predictable environment. This is true both for fibre deployment as well as for digital transformation.

How has BEREC evolved and what is next for BEREC?

■ **Dan Sjöblom:** One of the key success factors of BEREC is that it constantly evolves.

What is important to understand is that the regulatory framework is merely a framework. Within this regulatory structure, every Member State has a unique infrastructure requiring a regulation adjusted to the national circumstances. There is no "one size fits all".

Within BEREC, all these perspectives lay the foundation for regulatory discussions and solutions among independent regulators. Although it is difficult to say exactly how BEREC will evolve, we can see that there are still many challenges when it comes to connectivity, and further investments in infrastructure are needed. But we also see other potential bottlenecks emerging in areas where cross-regulatory cooperation will be increasingly important.

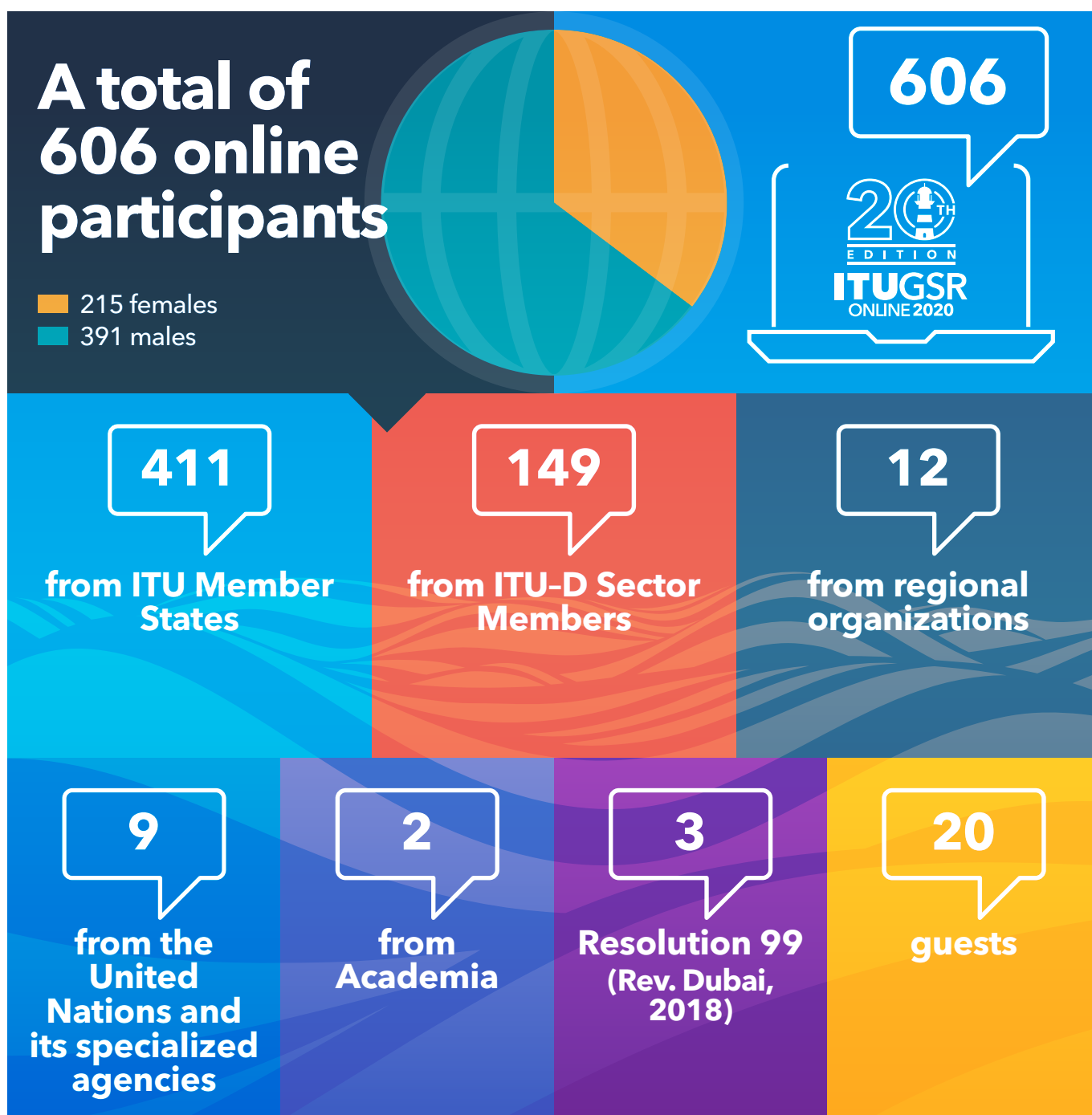
Why are the Best Practice Guidelines coming out of GSR important and how might they reflect what's happened in Europe?

■ **Dan Sjöblom:** The Best Practice Guidelines are a useful way for us as a global community of ICT regulators to highlight what we see as the best ways to encourage necessary ICT investment while protecting competition, security and privacy so that we can build robust digital economies that citizens trust. It's a great thing that we have an opportunity to update these each year in hopes to keep pace with the rapid and transformative industry change we see.

This year was an opportunity to update the Guidelines to reflect the evolution of ICT policy in Europe, where we see a high concentration of "5th Generation" regulation, which reflects the concerted effort to work across borders and industries to craft regulation that acknowledges the reality that ICTs underpin so many other industries. Digital is at the centre of the pandemic recovery. We have seen enormous developments in this short period – but how do we maintain the momentum? ■

GSR-20 by the numbers

The 20th edition of the Global Symposium for Regulators ([GSR-20](#)) welcomed:



Note: Participant numbers refer only to the GSR-20 core sessions held from 1 to 3 September.

Building back better after COVID-19: Key learnings from 20 years of ICT regulatory reform

By Stephen Bereaux

Deputy to the Director of the ITU Telecommunication Development Bureau

■ As we look back at 20 years of telecommunication/information and communication technology (ICT) regulation at this year's milestone Global Symposium for Regulators ([GSR-20](#)), there is no better time to understand how the responses and initiatives from the ICT sector during the COVID-19 pandemic can help ITU members – and the world – to build back better.

Two decades have seen GSR become the pre-eminent global meeting for regulators and policymakers to tackle the many challenges emerging from the convergence of ICT services.

“

The symposium also serves as a choice venue for regulators to interact and collaborate with the private sector to solve these and other critical challenges.

”

Stephen Bereaux

“

Points covered in GSR's online sessions reflected what ITU members and the wider ICT community need to bear in mind as the so-called 'new normal' takes shape.

”

Stephen Bereaux

From digital taxation frameworks to consumer trust, infrastructure sharing to network investment, the symposium also serves as a choice venue for regulators to interact and collaborate with the private sector to solve these and other critical challenges.

This year, as its own response to COVID-19 restrictions, GSR went digital and was held as a virtual meeting from 1–3 September 2020. As the world moves from response to recovery in the face of the COVID-19 pandemic, points covered in GSR's online sessions reflected what ITU members and the wider ICT community need to bear in mind as the so-called “new normal” takes shape.

5 key approaches to the 'new normal'

First, how might **institutional frameworks** be made fit-for-purpose in a post-COVID world? Key issues addressed are privacy and data protection – especially concerning health information.

Does the advent of contact tracing and tracking apps require even closer collaboration between data protection agencies and telecoms? What is the role of telecoms in tackling the global issue of COVID-19-related misinformation and disinformation?

What is clear is that new and existing institutional frameworks must be designed to support data privacy and help combat misinformation.

It is also important to understand the **sector competition impacts of the post-pandemic era** – particularly in terms of data sovereignty, and data ownership.

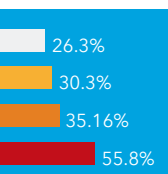
Changes in market power between industry segments also come into play here. For example, operators may face long-term reduced demand or higher costs as the world recovers from the pandemic.

At the same time, initial indications suggest that so-called “tech giants” may become significantly stronger under a range of potential future scenarios. Such a situation could arise not only because of the sizeable market power of these companies, but also because of their critical role as the gatekeepers for smartphone operating systems, which must be opened for contact tracing apps, tackling COVID-related disinformation, and more.

This shifting balance of market power between these two segments of the communications and technology industries may, in turn, require new regulatory settings.

The pandemic has caused remote working to shift from exception to norm in many workplaces around the world. But working from home comes with increased cybersecurity risks such as malware infection, unauthorized access, data security, and insecure devices.

Hackers and online scammers are taking advantage of these risks, with cybercrime accelerating as COVID-19 continues to spread.



A [report](#) by the security firm Mimecast revealed that during the first 100 days of the crisis, spam and opportunistic detections increased by 26.3 per cent globally, impersonation was up 30.3 per cent, malware by 35.16 per cent and the blocking of URL clicks by 55.8 per cent.

In response to these increased cybersecurity threats, governments have taken steps to address gaps in digital trust and security. For example, the Welsh Government announced a GBP 248 000 cyber grant scheme for local authorities to help strengthen their IT systems.

The Australian Cyber Security Centre released guidelines that outline key cybersecurity practices for people who are working from home.

In many countries, **spectrum availability and capacity** were expanded as temporary emergency measures during the pandemic to accommodate surges in traffic and to ensure continued service delivery.

Such responses typically involve allowing the use of either vacant spectrum or unused spectrum of existing licenses.

The time has come to carefully examine how such temporary measures will be bridged with the new "normal", while providing greater network access and maintaining improved quality of service for all.

Last but not least, **inclusion, accessibility, and digital divide issues** will be heightened in a post-COVID scenario due to the fact that the negative impacts of the pandemic will fall more heavily on vulnerable populations.

On social equity grounds in the post-COVID world, there are pressing reasons to accelerate connectivity and digital skills for an estimated 3.6 billion people who remain totally offline, in addition to a more urgent need for universal service strategies and policies to combat new forms of digital divide. That means the need for improved affordability of ubiquitous broadband for all citizens and residents will only grow in the post-pandemic scenario.

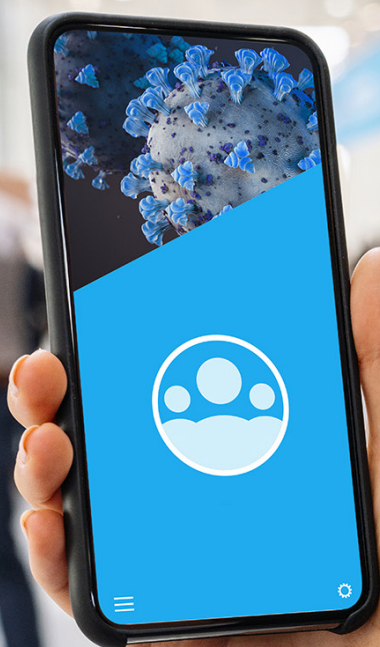
Terrestrial network deployments and innovative future technologies such as non-GEO satellites and HAPS should be facilitated in order to connect the unconnected. As ITU Secretary-General and Broadband Commission

for Sustainable Development Co-Vice Chair Houlin Zhao recently stated, "As the COVID-19 pandemic accelerates, making in-roads in the developing world and threatening all of humanity, we need to take immediate action to ensure no one is left behind. This unprecedented crisis shows that nobody is safe until we are all safe. And it shows, with no ambiguity, that we will not unleash the full potential of broadband until we are all connected."

Building on GSR learnings to shape the 'new normal'

Despite the considerable uncertainty involved in looking further out, ITU members are encouraged to "look back to the future" and bear in mind the collective learnings facilitated by [REG4COVID](#) and compiled in the discussion paper during the GSR deliberations.

We look forward to collectively tackling challenges in the new post-COVID-19 context, from encouraging investment, to fostering innovation, from facilitating sector competition to pursuing social equity and inclusion in transformed economic and societal environments everywhere. ■



How can ICT regulators respond to COVID-19? 5 key findings from new GSR paper

By Sofie Maddens

Head of Regulatory and Market Environment Division, ITU

■ Shortly after the declaration of COVID-19 pandemic lockdowns across most parts of the world, ITU raced to launch the Global Network Resiliency Platform ([#REG4COVID](#)) in March 2020.

Since then, information and communication technology (ICT) regulators and policymakers from all regions of the world have gone to the platform to share useful insights, best practices and lessons learned to boost network resiliency in the face of unprecedented network demands.

“

REG4COVID has become a veritable treasure trove of tried-and-tested initiatives.

”

Sofie Maddens

REG4COVID – a treasure trove of initiatives

By facilitating the sharing of this type of relevant information and expertise, REG4COVID has become a veritable treasure trove of tried-and-tested initiatives, regulatory measures and policy actions, all of which are grounded in international experiences and best practices.

By mid-June, the [platform received over 400 contributions](#), demonstrating a strong motivation on the part of countries to collaborate and share experiences in different areas, from consumer protection to traffic management to the availability and accessibility of broadband, emergency telecommunications, and beyond.

Many of the initiatives submitted to the REG4COVID platform made their way into a GSR discussion paper entitled “[Pandemic in the Internet Age](#)” published in June 2020. The paper offers ICT stakeholders a thorough analysis of these measures, as well as trends for different groups of stakeholders developed in countries worldwide.

Immediate and long-term regulatory responses

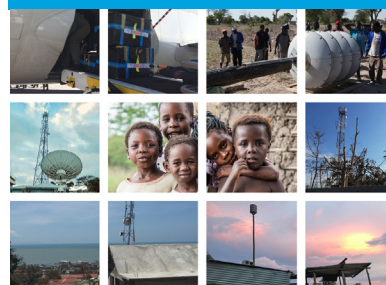
Both immediate and long-term responses are covered, as well as strategies and best practices to inform a well-prepared recovery. These can range from ensuring resilient connectivity, business continuity and service delivery (especially during data traffic surges) to maintaining continuity of vital services while ensuring affordable, safe, and secure access to online services. The report also identifies which practices should be considered for inclusion in a national emergency telecommunication plan (NETP), as well as broader ICT contingency and development plans.

Despite the lockdowns that have been enforced worldwide, the use of digital tools has enabled some level of economic activity to continue in many countries.

“Pandemic in the Internet Age” highlights the differences that may occur due to market maturity and economic development while identifying innovative regulatory measures needed to address specific challenges for operators, businesses, governments, and end users – including most vulnerable populations.

The report also provides a checklist of actions and regulatory measures for better preparedness to complement the recently released [ITU emergency communications guidelines](#).

ITU Guidelines for national emergency telecommunication plans



The [ITU Guidelines](#) are a critical tool to assist policymakers and national regulatory authorities to develop a clear, flexible and user-friendly national emergency telecommunications plan with a multi-stakeholder approach. The guidelines can be used for developing tailored contingency plans for emergencies caused by natural hazards, epidemics and pandemics.

“

'Pandemic in the Internet Age' highlights the differences that may occur due to market maturity and economic development.

”

Sofie Maddens

Key findings from “Pandemic in the Internet Age”

1 From an economic perspective, **the cost of delays in deploying new technologies and services is higher than ever.** In a post-pandemic world, telecommunications and ICT services are now more valuable to society. Each year of delay in providing better and increased levels of service results in a materially greater opportunity cost.

2 This means it is now socially optimal and arguably imperative to **urgently bring forward deployment of new digital infrastructure.**

Implementing this key finding can look like the assignment of in-demand IMT spectrum and new generations of technological standards, for example, or moving more rapidly to 4G and 5G, or addressing the COVID-19 specific challenges around contact tracing and disinformation.

3 **Equity challenges in accessing telecommunication and ICT services in the post-COVID world must be addressed.**

To the extent that improved access to telecommunications and ICT services can provide social inclusion, access to services, gender equality, access to education and, potentially, access to employment, ICT has an essential role to play in offsetting these negative equity impacts of COVID-19.

4 While it may be tempting to consider that an effective vaccine would enable the world to return to pre-pandemic days, many factors suggest that **“the new normal” may look quite different.** For telecommunications operators, this might look like adapting networks to increased video traffic, improving quality and reliability, and continuing to build capacity while accelerating 4G/5G deployments. However, the key elements that comprise or influence the “new normal” for the ICT sector should be further reviewed in 12 months. In the medium and longer term, there will be flexibility for more substantial and sustainable responses.

5 Lastly, while the world is trying to comprehend what the “new normal” will look like, it is clear that **the changes forming now will be enduring.**

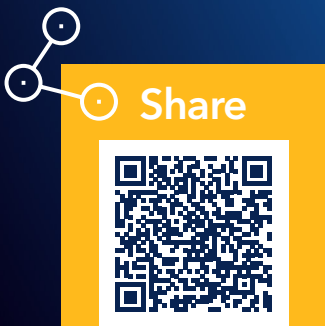
As Canadian Prime Minister Justin Trudeau stated, “COVID-19 will be one of the things that creates changes in our society. Our responsibility as a society, as governments, is trying to figure out how to minimize the negative impacts of those changes while maximizing the safety of [our citizens]”. ■



Share your experiences with REG4COVID

The new Global Network Resiliency Platform ([#REG4COVID](#)) is a place where regulators, policymakers and other interested stakeholders can [share](#) information, [view](#) what initiatives and measures have been introduced around the world designed to help ensure communities remain connected.

Global Network Resiliency Platform



Join ITU's online communities on your favorite channel



GSR-20: Responding to challenges of digital transformation in the wake of global crises and beyond

■ Promoting an adaptive, resilient and collaborative regulatory system is key to “building back better” and advancing digital transformation for all, according to participants at ITU’s 20th edition of the Global Symposium for Regulators ([GSR-20](#)), held virtually from 1 to 3 September.

Regulatory authorities that gathered at GSR-20 agree that in the wake of COVID-19 digital regulation can boost the readiness of digital markets to face unexpected events and emergencies, and together, they adopted [GSR-20 Best Practice Guidelines: The gold standard for regulation](#) to respond to the challenges of digital transformation in the aftermath of global crises and beyond.

This year’s GSR-20 programme kicked off on 30 June 2020 with a leadership debate “Resilient and secure digital connectivity for all: COVID-19 Recovery and lessons learned for better preparedness and response”.

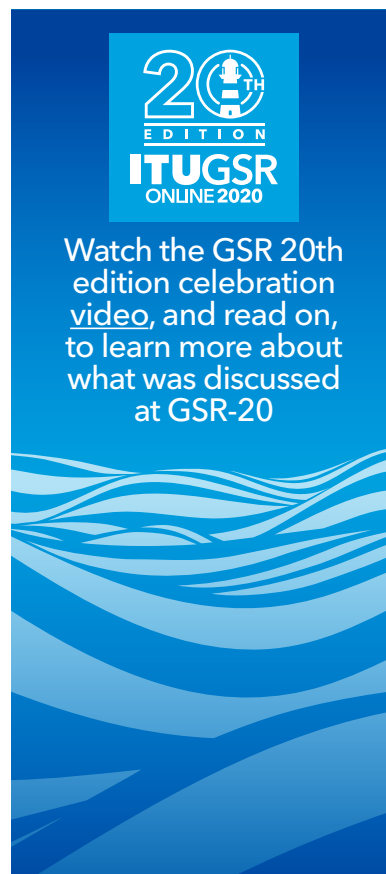
The event was followed by Regional Regulatory Roundtable Discussions for the Europe, CIS, Arab States, Africa and Asia-Pacific regions.

On 27 and 28 August, the United States Telecommunication Training Institute (USTTI) and ITU organized [webinars on Behind the Scenes Look at Emerging Technologies](#) to explore the work taking place to prepare for the deployment and usage of emerging technologies. Experts provided regulators with information on the technological underpinnings of emerging technologies and the spectrum planning that is taking place to enable these new services.

GSR-20 also featured the [Regional Regulatory Associations meeting](#) and the Industry Advisory Group for Development Issues and Private Sector Chief Regulatory Officer's meeting ([IAGDI-CRO](#)) on 31 August, and the Heads of Regulators Executive Roundtable on 1 September.

Finally, the core sessions in September included a series of lightning sessions presenting the Global Network Resiliency Platform ([REG4COVID](#)); the new [Digital Regulation Handbook](#) and [online platform](#), a collaborative effort between ITU and the World Bank; the [outcome report](#) of the Economic Experts Roundtable; and the [Global ICT Regulatory Outlook](#) and [ICT Regulatory Tracker](#).

For a number of the online sessions participants woke up at the crack of dawn, from different sides of the globe, for this event that every year brings experts from regulatory bodies and private sector entities together to discuss telecom regulation in an increasingly changing world. ■





Fit-for-purpose: Why 5th-generation regulation is an essential ingredient of digital transformation

By ITU News

■ 20 years after the first-ever Global Symposium for Regulators (GSR), the era of 5th-generation regulation is here – and more important than ever before in the wake of the challenges posed by the COVID-19 pandemic.

Faced with multiple crises, from the pandemic to global climate change, are regulators sufficiently equipped to deal with the new and fast-moving realities of digital transformation?

This was a key question underpinning the first day of GSR-20, both at the Heads of Regulators Executive Roundtable and the first core session, entitled “Fit-for-Purpose institutional frameworks for digital transformation: Demystifying the collaborative regulator in a post-COVID digital ecosystem.”

What does ‘fit-for-purpose’ mean in a regulatory context?

Digital transformation is no longer a “nice-to-have.” Rather than an option, it is now a matter of urgency that tops government agendas worldwide. Globally, the pandemic made this fact clearer than ever. Today, and especially post-pandemic, 5th-generation regulation must be in place for digital transformation to reach its full potential.

“

ICTs are the backbone that all sectors rely on.

”

Hossam El Gamal

Executive President of the National Telecom Regulatory Authority (NTRA), Egypt

Regulation must also be “fit-for-purpose”, meaning that regulators are acutely attuned to and actively leveraging digital evolution by adapting regulatory functions, capacity, skills, and tools to the digital era.

Gone are the days regulators worked in silos, crafting their own specific regulations and policies. “ICTs (information and communication technologies) are the backbone that all sectors rely on,” affirmed Hossam El Gamal, Executive President of the National Telecom Regulatory Authority (NTRA) in Egypt. Now that ICTs underpin the operations of all sectors in

terms of safety and security, efficiency, dynamism, competition, every sector from finance to education and even health must engage with ICT regulators in ways they have never done before.

Five hallmarks of fit-for-purpose, 5th-generation regulation

So what does fit-for-purpose regulation actually look like, and why is it an essential ingredient for digital transformation? Look for the following five characteristics to determine whether regulatory actions are truly fit-for-purpose:

20th EDITION ITUGSR ONLINE 2020

HEADS OF REGULATORS EXECUTIVE ROUND TABLE



1 Collaborative and cross-sectoral:

5th-generation regulation is more open to partnership, not just between governments, but between a plurality of actors, from policy-makers and regulatory bodies to the private sector, and from academia to international organizations like ITU.

According to Nerida O'Loughlin, Chair of the Australian Communications and Media Authority (ACMA), "regulators will need to switch their focus beyond regulating within the traditional sectoral frameworks, to look at frameworks which are outcomes-based, future-focused and technology-neutral."

Collaboration is doubly essential in light of truly global crises, such as the COVID-19 pandemic. "As satellite operators we are used to respond to emergencies, but now this emergency is happening at a whole different scale because it affected the whole world," remarked Alan Kuresevic, Vice President of Engineering at SES Techcom. "We need to encourage dialogue between public and private sector to overcome the current issues and become more efficient."

2 Light-touch and agile:

The ICT world is fast-moving, regulators are constantly thrown new challenges that span once-disparate sectors – from data protection and privacy, the implications of artificial intelligence (AI), and much more. Fit-for-purpose entails practical and more agile collaborative platforms to replace bureaucratic and more siloed "business-as-usual" models of policymaking.

As Irene Kaggwaw Sewankambo, Director General of the Uganda Communications Commission (UCC) noted, "today, innovation is faster than regulation and we need to be able to adjust the way we work. Regulators need to step up to [the pace of] this digital economy."

3 Inclusive:

This multiplicity of actors must work together to create win-win strategies that benefit not only one another, but the people of the world, in the context of the SDGs. Part of tackling SDG 10 (Reduced inequalities), for example, involves addressing the challenge of digital inclusion by leveraging ICTs towards universal connectivity. That means deploying radical new approaches to

ensure the remaining estimated 46 per cent of the world gets connected, no matter where they live or their socio-economic status.

Universal connectivity by 2030 is also the basis and chief goal of the United Nations Secretary General's Roadmap for Digital Cooperation, explained Fabrizio Hochschild, Under-Secretary General of the United Nations. "Regulators have a key role in the roadmap. [...] Adequate regulatory frameworks can make a difference whether or not networks can be accessed affordably. They can make the difference whether networks are safe or not," he said.

“

Collaboration with all sectors is absolutely critical to ensure the responsibilities are shared and to help end users overcome their difficulties.

”

Bety Aichatou
Habibou Oumani

Council President of Niger's
Regulatory Authority for
Telecommunication and Posts

It is also important for regulators to remember the end user as they work to collaborate more closely. As Bety Aichatou Habibou Oumani, Council President of Niger's Regulatory Authority for Telecommunication and Posts pointed out, "collaboration with all sectors is absolutely critical to ensure the responsibilities are shared and to help end users overcome their difficulties."

4 Flexible: ICTs have eclipsed simple "communications" to become the bedrock of nearly every economic sector; they are vital to business performance and national growth. That ubiquity has ushered in a host of new players and different sectors – each with their separate regulatory challenges in play.

"In Africa, we had to be very flexible with regard to certain number of procedures, be they customs procedures or banking procedures," said Charles Millogo, Chairman of the Regulatory Authority of Electronic Communications and Post in Burkina Faso.

"We had to develop initiatives that would allow us to be flexible in the use of our resources. We realized with the increase

in traffic, that operators needed more resources spectrum, for example, and therefore we had to respond [...] to the challenges in an efficient and flexible manner," he said.

5 Iterative: Not only is flexibility needed in this brave new regulatory world, but also the capacity to iterate. "The best regulation is like a software: it often comes from an iterative process. A back-and-forth between the government and the private sector [is needed] to try to achieve the goals and rolling out over time," noted Kevin Martin, Vice-President for US Public Policy at Facebook.

“

In Africa, we had to be very flexible with regard to certain number of procedures, be they customs procedures or banking procedures.

”

Charles Millogo

Chairman of the Regulatory Authority of Electronic Communications and Post, Burkina Faso

A strong example of regulatory collaboration with digital platforms was offered by O'Loughlin. She described how the Australian regulator "set out a model to guide digital platforms in developing their code," and with 3 objectives: reduce impact of harmful misinformation, empower people to judge the quality of news and information, and enhance transparency and accountability in digital platform practices.

Fit-for-purpose also means fit-for-investment

At the same time, regulators will soon face the challenge of putting the pandemic behind them and looking to the future. How will governments nurture their digital economies in this new paradigm? How can regulators create a futureproof investment climate for digital transformation without ceding too much power to external influences?

Americo Muchanga, Chairman at the National Institute of Communication of Mozambique (INCM), pointed out the challenge facing regulators of "investing with less cash" and creating a more affordable investment environment.

"Can we make spectrum available for less than it used to be normally?" Muchanga asked, questioning the role of government. In Mozambique, regulators were "providing spectrum for free during this period of pandemic and encouraging operators not to charge for service or users that cannot pay during this period," he added.

According to El Gamal, the Egyptian government invested around 2 billion USD in its strategy for digital transformation in 2019. "We believe the investment in ICT structure is important. Also, faster responses and collaboration are key success factors in coping with the new norm where we are physically in one place but virtually, we are in multiple places," he said.

Another example of this kind of futureproof investment in infrastructure was shared by Federal Communications Commission (FCC) Chairman Ajit Pai: "The biggest reason why US carriers were equipped to handle this increase in traffic was the investments they made long before anybody heard of COVID-19," he said.

Pai went on to describe record levels of investments in networks and fibre deployment in the United States between 2018 and 2019, "accounting for more growth than in the years 2015 to 2018 combined." Thanks to these investments, "average fixed broadband speeds in the United States have doubled since December of 2017. [...] Our network has been able to sustain the demands placed upon it by the pandemic. [...] What does this tell us as regulators? For me, it is a powerful reminder that unleashing private markets often is the most effective way to advance the public interest," affirmed Pai.

Towards fit-for-purpose digital transformation in a post-COVID world

Digital transformation will be an important piece of the economic puzzle, especially in the wake of the COVID-19 crisis. "The current situation has allowed us to see things differently and we now need to confront this massive paradigm shift," highlighted Louis-Marc Sakala, Director-General of Congo's Regulatory Agency of Post and Electronic Communications (ARPCE).

“

The biggest reason why U.S. carriers were equipped to handle this increase in traffic was the investments they made long before anybody heard of COVID-19.

”

Ajit Pai

Chairman of the US
Federal Communications
Commission (FCC)

"ICTs are therefore now essential to be able to work and live. We now need to work together; we need to listen and learn from each other to address this change."

Despite the considerable uncertainty involved in looking further out, GSR discussions encouraged participants to "look back to the future" and bear in mind the collective learnings facilitated by platforms like [REG4COVID](#) and compiled in the GSR-20 Best Practice Guidelines, released during the final session of GSR-20. ■

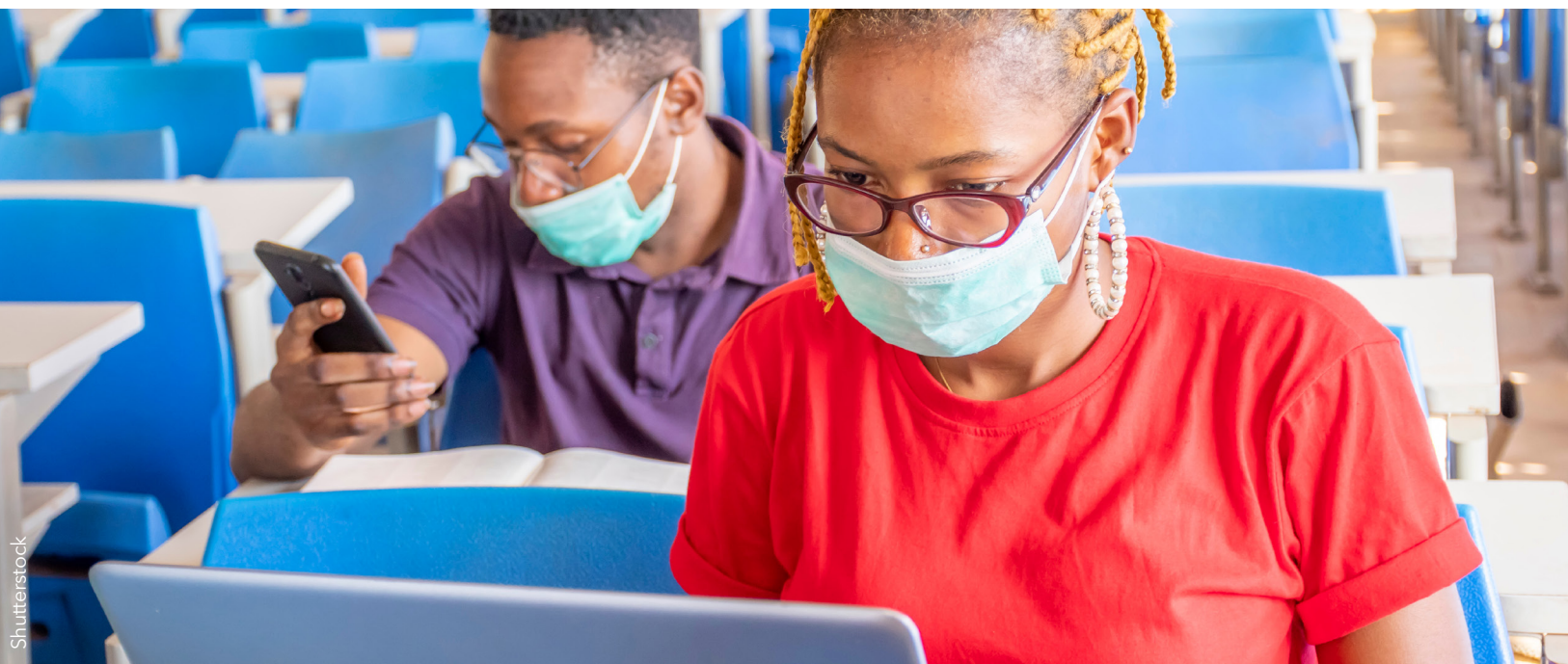
Connecting humanity study

How much would it cost to connect the 3 billion offline population to the Internet by 2030? Is it only about infrastructure costs? What role does an enabling environment play? What regulatory measures will foster deployment and use?

Answers to these questions can be found in the new [ITU study](#) on assessing investment needs of connecting humanity to the Internet by 2030.



Join ITU's online communities on your favorite channel



How can ICT regulators collaborate to build back better after COVID-19?

By ITU News

■ For ICT regulators, building back better means bringing affordable, safe, secure and trusted connectivity and online access and use to people in their respective regions. It also means making sure everyone is connected, no matter where in the world they live or their level of socio-economic means.

These ideas shaped the discussions of the annual meeting of Regulatory Associations

(RA), held virtually on the eve of the 20th Global Regulators Symposium ([GSR-20](#)) core sessions.

Chaired by incoming Body of European Regulators for Electronic Communications (BEREC) Chair Michel Van Bellinghen, the meeting featured a panel discussion on how regulatory associations can collaborate in a post-COVID digital ecosystem.

“

The COVID-19 crisis is also a window of opportunity that the regulatory community cannot afford to miss.

”

Dan Sjöblom

Chair of GSR-20, Director-General of the Swedish Post and Telecom Authority (PTS), and Chair of BEREC

The panel was followed by a presentation of different projects and activities of each RA since GSR-19, with a focus on how each is rebuilding towards meaningful connectivity in the post-pandemic world.

Causes for optimism

Despite bearing all the hallmarks of a crisis, there are many reasons for regulators to be hopeful in the wake of the pandemic. "The COVID-19 crisis is also a window of opportunity that the regulatory community cannot afford

to miss," declared Dan Sjöblom, Chair of this year's edition of GSR, Director-General of the Swedish Post and Telecom Authority (PTS), and current Chair of BEREC, in an earlier regional regulatory round-table session.

While networks have been pushed to their limits during the COVID-19 crisis, "they have largely remained operational and resilient," affirmed Doreen Bogdan-Martin, Director of ITU's Telecommunication Development Bureau, who was also present at the RA meeting.

“
Networks have largely remained operational and resilient.”

Doreen Bogdan-Martin

Director of ITU's
Telecommunication
Development Bureau



Moreover, the current crisis has also fast forwarded the adoption of digital technologies. “We now live in a world where we work, interact, and do business differently,” she noted.

Teleworking proved to be particular boon in the form of higher member participation for some regulatory associations. “The pandemic forced us and our members to work from home,” said Allan Ruiz, Executive Secretary of the Regional Technical Telecommunications Commission (COMTELCA). “This gave us the opportunity to interact with more of our members, because they did not have to travel for the meetings.”

The challenges of building back better

There are many hurdles to overcome as regulators across the world shift from pandemic response to recovery. According to the latest ITU data, 3.6 billion people remain unconnected worldwide. In many remote areas of the planet, broadband development is hindered by demographic or even geographic constraints.

In still other places, permanent connectivity is simply not affordable. This is the case in many parts of West Africa, noted Abossé Akue-Kpakpo, Digital Economy Director of the West African Economic and Monetary Union (UEMOA). “In some [West African] countries, the cost of broadband can reach 60 per cent of the average salary,” he noted. “This makes it impossible for citizens to work [remotely] or follow education online.”

Quality of service remains a major challenge in Africa, as well as regulatory issues around roaming, added Laminou Elhadji Maman, Secretary General of the West Africa Telecommunications Regulators Assembly (WATRA).

Investment resources for information and communication technologies (ICTs) will likely be harder to come by with the impending economic crisis projected to follow the health crisis. Even without considering the pandemic, potential investors in the ICT sector must deal with long cycles in terms of return on investment, as well as high operational and maintenance costs when it comes to servicing remote and underserved areas.

Sharing solutions

In a post-COVID digital ecosystem, regulatory association representatives agreed that collaboration is crucial – especially at the national level within government departments, but also at the regional level between countries.

For example, sub-regional initiatives in West African countries including Burkina Faso, Niger, Mali are helping to ensure cross-border connectivity, remarked Charles Milogo of the Francophone Network of Telecommunication Regulation (FRATEL). “Regulatory associations must keep on collaborating to ensure that connectivity plans are carried out,” he said.

To address the issue of unaffordable connectivity, Akue-Kpakpo suggested putting subsidies in place similar to those some countries have implemented for water and electricity.

According to Ruiz, his organization developed a guide of best practices on the “rational use of the Internet” to not overwhelm communication networks.

“

We also implemented the 'e-wallet': a virtual wallet enabling people to collect their salary remotely.

”

Karima Mahmoudi

Director of the Electronic Communications Market Observatory, Instance Nationale des Télécommunications of Tunisia (INTT)

Some of the measures that were taken included additional temporary spectrum use, regulatory sandboxes, and agreement with content providers on lowering the quality of their streaming services during the lockdown period, he said.

Representing BEREC, incoming Chair Michel Van Bellinghen conceded that while there was no major congestion in Europe, the networks did face pressure during the first weeks of the lockdown in spring. “Big platform operators were asked to reduce the quality of their streaming service so that networks can cope with the increased demand,” he noted.

“We are holding workshops on cybersecurity to increase consumer awareness,” said Antony Chigaazi of the Communications Regulators’ Association of Southern Africa (CRASA), citing a need to further “finetune activities and priorities in view of COVID-19.”

According to Karima Mahmoudi, Director of the Electronic Communications Market Observatory, Instance Nationale des Télécommunications of Tunisia (INTT) and representative of the Arab Regulators Network of Telecommunications and Information Technologies (AREGNET), Tunisian authorities experimented with emerging technologies, using robots to verify the movement of people in order to limit transmission of COVID-19. “We also implemented the ‘e-wallet’: a virtual wallet enabling people to collect their salary remotely and avoid moving or getting into crowds,” she said.

Some of the practices mentioned in this meeting will remain with us on the long term, noted Bogdan-Martin in her summary of the first panel discussion.

Top priorities for regulators in the post-COVID future

To address future challenges, regulators need forward-looking mindsets that can anticipate future trends, suggested Van Bellinghen. One of these is sustainability, which will be a main focus for BEREC in 2021, he said.

Among the priorities regulatory associations mentioned include reduced costs for internet access, as well as regional public warning systems that can send alerts to all phones in the area in case of a major emergency.

The harmonization of spectrum use was mentioned as another top priority, as well as implementing common activities across regions, such as a digital identity system that is interoperable and can facilitate travel at the regional level. Finally, closing the digital gap is a top priority for regulators, especially in terms of education. In the case of Burkina Faso, for instance, students attending private schools often benefit from internet access at home to access learning materials, while many public-school students do not, said Akue-Kpakpo.

Next steps: Take stock and collaborate

The tasks ahead of regulators are two-fold, suggested Van Bellinghen. The first includes a thorough assessment of measures taken in the last months – such as the ones compiled in ITU's Global Network Resilience Platform [REG4COVID](#), where regulators and policymakers from all over the world have submitted and exchanged best practices.

Echoing the need for sharing challenges and exchanging experiences, Ruiz suggested that the role of local governments will be crucial in the coming months, in that they will need to be informed of discussions and best practices defined by regulators. "Regulatory challenges must be shared among all countries and multilateral actions have to take place to move forward in the future," he said.

Secondly, collaboration must be deepened between institutions, said Van Bellinghen in his closing remarks. Because no matter the nature of the emergency, "no country, no regulator can fight a crisis on its own." ■



Looking back to the future with GSR-20 Alumni interviews

To celebrate the special occasion of the 20th edition of GSR, ITU planned a series of short interviews with former regulators inviting them to look back at how regulation has changed, evolved, and is shaping the regulation of tomorrow.



Alumni interviews #1

In this first episode of “Looking back to the future” interviews, distinguished former regulators discussed the role of government in a post-COVID world.

“

The scope of the regulator has very much increased, and the skills required of the regulator are very different.

”

Alan Horne

Senior advisor, to Ministers, Regulators and Boards of companies throughout Europe Middle East and Africa (former regulator ([TRBR](#)), Vanuatu)

“

Policymakers and regulators must be prepared to take risks to work outside their core scope of functions and be open-minded.

”

Dalsie Baniata

Telecommunications Regulatory Advisor to the Ministry of Public Infrastructure, Industry and Commerce, Republic of Palau (former regulator ([TRBR](#)), Vanuatu)

“

One restriction that telecom regulators have today is that the legal framework in which they operate is quite old.

”

Diego Molano

Advisor on Digital Transformation of Governments and Corporations, startup mentor, technology policy expert, talent creator, (former minister ([MinTIC](#)), Colombia)



Alumni interviews #2

In this second episode of “Looking back to the future” interviews, distinguished former regulators discussed the impact of Emerging trends and innovation on the telecommunication industry, policy and regulation.

“

Looking back it seemed like a simpler environment then — the competition was a good way of securing the interests of consumers, and in those days, that seemed to work.

”

Kip Meek

Chairman, [Ascension Ventures](#) (former Board Member, [OFCOM](#), Switzerland)

“

We have to enable our licensees and our consumers to be able to access services that serve their needs and that fit the purpose to survive and thrive in this global economy.

”

Kathleen Riviere-Smith

Executive Director, Organisation of Caribbean Utility Regulators (OOCUR) (former Chief Executive Officer, [URCA](#), the Bahamas)

“

When I was a regulator a lot of the discussion was about simple things like ‘how good is this?’ whereas now it is about, ‘how bad is this?’

”

Goran Marby

CEO and President, [ICANN](#) (former Director General, [PTS](#), Sweden)

“

By what mechanism does international collaboration actually translate into real change? Well it has to be through persuasion, imitation, education — which is all about discussion.

”

Philippe Metzger

General Secretary and CEO, [IEC](#), (former Director General, [OFCOM](#), Switzerland)



Amir Azeem Bajwa
PTA

Introducing the session Chairman of the Pakistan Telecommunication Authority (PTA), Amir Azeem Bajwa, said that while the interplay of technology, regulations and competition have laid the foundation of the modern digital infrastructure, “the criticality of telecom technology and interdependency became more evident when the whole world looked towards the Internet to learn, earn, and communicate during the COVID-19 lockdowns.”

At the same time the boundaries of the traditional technology landscape are increasingly becoming blurred and the rules of the game rewritten, with startups and new technologies such as 5G, artificial intelligence, blockchain, IoT, biotech, cloud computing, all disrupting the socioeconomic structures.

Businesses are right in their approach to capitalize on this new wave of information revolution, Bajwa affirms but, “governments and regulators are struggling to match the pace of the technological advancements with effective policy and regulation.”

Here are just some of the panellists’ views and best practices shared on these aspects of facilitating connectivity.

“

[Data-driven regulation] is a fantastic tool for modern regulation — in particular in the digital world.

”

Serge Abiteboul
ARCEP

Data-driven regulation – an additional tool for regulators

Serge Abiteboul, Board member of French regulator ARCEP (*Autorité de régulation des communications électroniques, des postes et de la distribution de la presse*), hailed a new regulatory mechanism based on [data-driven regulation](#), which he says “is a fantastic tool for modern regulation – in particular in the digital world.”

On 24 July 2019, several French regulators worked together to draft a dedicated [memorandum on data-driven regulation](#), a process that allows the ability to make stakeholders more accountable, increases the regulator’s capacity for analysis and makes more information available to users and civil society.

The two core objectives of data-driven regulation are to: 1) amplify the regulator’s ability to act, notably in a supervisory capacity; and 2) enable users to make informed choices and better shepherd the market.

“With the information [collected] regulators can detect systemic problems, can detect weak signals, and the regulation can be made more reactive, more effective and more agile,” said Abiteboul.

Keeping citizens connected, informed, and educated during lockdown

Mario Fromow, Commissioner of the Federal Telecommunications Institute (IFT), Mexico’s telecom regulator, explained how a collaborative effort had kept the country’s citizens connected, informed, and educated during COVID-19 lockdowns.

Through emergency plans citizens were given 150 short messages on mobile and voice messages free of charge. Attractive price plans were also put in place for fixed services, and citizens were given access to official health-related information.

Fromow pointed out that Mexico was the first country in Latin America to make the switchover from analogue to digital, and that by using digital terrestrial TV to provide e-learning, both through broadcasting and telecommunication networks, ensured that students in Mexico remained connected and kept learning remotely.

Maintaining global access to the open Internet

Goran Marby, President and CEO of ICANN, and former Director General of the independent regulatory body and telecom authority highlighted his opinion on the importance of keeping access to the open Internet.

"We have realized over the years that it is becoming more important for us to work together with the regulators and legislators – to contain this thing that we call the open Internet – everyone should be able to access this network from anywhere in the world," said Marby.

According to Marby there are threats to that model, pointing out that there are legislations around the world happening that can have an effect on people's ability to connect to the Internet.

“

We have realized over the years that it is becoming more important for us to come together and work with regulators and legislators.

”

Goran Marby
ICANN

"We see standardization proposals especially when it comes to 5G where we can actually disconnect users from the Internet," says Marby. This, he says, changes the underlying concept of the free flow of information on the Internet.

"We need to find new ways of cooperation when it comes to the technical community I represent here, together with the regulators and legislators," concluded Marby.

Pumping infrastructure investment – towards exposed regulation

Amir Al Gibreen, Vice President of Regulatory Affairs, Saudi Telecom Company (STC) told the audience about Saudi Arabia's investment in telecom infrastructure, pre and post-COVID.

"We have seen an increase of almost 40 per cent in the traffic over the Internet, rising from almost 50 terabytes per month, all the way to almost 80 terabytes per month – which had a major impact on the network," said Gibreen.

Key to this result was STC's adequate preparation coupled with collaboration with the Government, who had since 2016 been pumping investment into the infrastructure.

According to Gibreen, Saudi Arabia has had no issues in providing services to the government or to the public. "There was no effect to the users or the schooling at that time during the lockdown. School continued for the second semester online," he said. "Regulatory collaboration as defined by the ITU is a major undertaking to be taken by the regulators regionally and around the world. We're looking as investors and operators in this industry to have a collaborative effort, instead of going back to ex ante type regulations, towards ex post regulations..." concluded Gibreen.

Very important for Lesina is public private collaboration to modernize and harmonize the regulatory framework in order to promote investment in digital infrastructure. "This is the core of this discussion," he said.

Lesina believes that industry and global policymakers have a responsibility to cooperate, to develop new standards and best practices to allow cross border investment; best practices that are going to really promote infrastructure development to get to the next billion.

He told participants that in the United States AT&T has been working closely with the Federal Communications Commission (FCC) to develop the [Connect America Fund](#). "AT&T has committed to offering a service to 1.1 million additional rural homes and small businesses by 2020," he said.

Highlighting the importance of markets that are competitive where people can go to invest and to continue investing, "the reality is that connectivity and closing the digital gap is coming through competition," said Lesina.

“

It also takes sometimes years to achieve results, and sometimes maybe too slow for the new digital era.

”

Annemarie Sipkes
ACM

Connectivity has been growing at an incredible pace because of investments coming from the operators. "Prices went down.

And I think this is really what we should focus on," said Lesina, who recommends the development of standards and better policy, and then ensuring effective competition in the markets.

Netherlands-EU collaboration on competition law

Annemarie Sipkes, Director of the Telecommunications, Transport and Postal Services Department of the Authority for Consumers and Markets (ACM) in the Netherlands spoke about competition law.

ACM is an authority in the Netherlands to make markets work better for people and businesses. It applies consumer protection law and consumer law and is the regulator for various sectors among which are telecommunications.

Sipkes explained how the regulator is collaborating with the European Union. She said that in terms of telecoms it had been applying the Dutch net neutrality rules from 2012, and then from 2016 began applying the [European open Internet rules](#) instead.

According to Sipkes, the different set of rules have the same core idea in that telecom companies should not be able to form a bottleneck between consumers on the one hand and the Internet on the other. Telecom operators, "should not be the ones who decide what is accessible on the Internet," she said.

Sipkes pointed out, as mentioned earlier in the session that competition law is ex post, and is also very broadly applicable across markets.

"It also takes sometimes years to achieve results, and sometimes maybe too slow for the new digital era," she added. ■



Spectrum policy lessons and allocation mechanisms for 5G – post-WRC-19 and post-COVID

By ITU News

■ Radiocommunications and spectrum are central to the global digital transformation that has recently been accelerated by COVID-19. Spectrum assignments improve telecommunication infrastructure as well as access and services to users.

At the Global Symposium for Regulations 2020 ([GSR-20](#)), experts shared their views on spectrum use for emergency situations, lessons learned from

COVID-19, and the role of spectrum in the digital transformation process. They looked at spectrum valuation as an economic and social tool, spectrum licensing principles for new services such as 5G, and they also touched on fees and taxes for spectrum and impediments to new deployment.

As moderator of the panel session Leonardo Euler de Morais, Chairman of ANATEL in Brazil, pointed out: “5G is a major

revolution for customers that will benefit from a faster Internet, low latency and high-network reliability.” Businesses, he said, will be opened up to new possibilities with the Internet of Things (IoT).

Here’s what the GSR-20 panel participants had to say about spectrum policy lessons during COVID-19 and on the subject of spectrum for 5G.

ITU's role in spectrum requirements and standards

Mario Maniewicz, Director of the ITU Radiocommunication Bureau remarked how the pandemic has obliged businesses and governments to migrate to online tools and applications as quickly as possible.

“

This has greatly accelerated digital transformation all over the world.

”

Mario Maniewicz

Director of the ITU Radiocommunication Bureau

“This has greatly accelerated digital transformation all over the world,” he said.

Maniewicz explained how spectrum requirements and standards for IoT wireless access technologies are being addressed in the ITU Radiocommunication Sector (ITU-R). This includes the harmonization of frequency ranges, technical operating parameters for short range devices and support for massive machine type communications within the framework of the standards of IMT-2020 (more commonly known as 5G).

ITU-R's work is leading to the next World Radiocommunication Conference (WRC-23), which will conceive the future development of narrowband mobile satellite systems, enabling an aspect of the digital transformation known as the Fourth Industrial Revolution.

Characterized by IoT, all equipment devices and sensors are connected and can be monitored and controlled remotely.



“

We had spectrum in the inventory at the FCC that we allowed carriers to use on an immediate basis.

”

Brendan Carr

Commissioner of the US Federal Communications Commission (FCC)

The US spectrum swap mechanism

Brendan Carr, Commissioner of the United States (US) Federal Communications Commission (FCC) explained that what held the US in good stead during the pandemic to keep Americans connected was updating and modernizing its infrastructure rules to make building out infrastructure not only easier, but also less costly.

A secondary market for spectrum in the US allowed for spectrum swapping and spectrum sharing – a spectrum swap mechanism that according to Carr, also played a big role.

“We had spectrum in the inventory at the FCC that we allowed carriers to use on an immediate basis. Where one carrier had excess capacity, we let another come in and use that spectrum as well,” he said.

Going multi-band – key in Greece

Professor Konstantinos Masselos, President of Hellenic Telecommunications and Post Commission (EETT) shared with the panellists the status of spectrum allocations for 5G networks in his country.

Greece has completed several rounds of spectrum public consultations (the last one very recently). The final decision was to proceed with a multi-band option for 700 MHz, 2.1 GHz, 3.5 GHz and 26 GHz spectrum at end 2020.

5G is a complex network and according to Masselos “successful planning can only happen if all the necessary spectrum components are secure – and going multi-band, is key,” he said.

See [here](#) for information on all European national 5G spectrum assignments.

Incentives for investment

Masselos says that “5G is clearly a capital investment project and to allow fast network deployment upfront spectrum licensing costs and overall spending need to be kept low.”

The Greek regulator’s approach has been twofold. Firstly, it has worked intensively towards considering a reasonable spectrum valuation, based on benchmarking prices from different countries and evaluating different models to calculate reserve prices.

Secondly, with the flexible payment approach bidders are asked to pay only 30 per cent of the bidding price up front, and the rest in several installments, starting three years after the auction.

Greece introduced a payment method for spectrum as the network grows. To provide further incentives for investment it has provided the possibility of extending the licences from 15 to 20 years’ duration.

Masselos concluded by saying: “We did our best to look at the broader picture, learned from previous experience from around the world, and targeted the long-term returns of getting the Greek economy exposed to 5G faster.”

Spectrum licensing for 5G – the Indonesian perspective

Dr Ir. Ismail, Director General of Spectrum Management and Standardization of Post and ICT at Indonesia's Ministry of Communication and Information Technology shared his view on the key principle for spectrum licensing for 5G, which he says is simply, looking at 5G broadly – the whole ecosystem including the business process related to spectrum management and the ability of the network and infrastructure and devices.

He says that 5G needs to be deployed at the right time. He recommends that for spectrum planning "5G spectrum allocation should be available at the same time in low band, mid band and high band. Also, the spectrum that needs to be deployed should be adequate in terms of the bandwidth," says Ismail.

Preparing 4G networks for 5G

Ismail recommends that operators should not wait for the 5G spectrum to be released before preparing their 4G networks to be ready to go to 5G.

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The 5G spectrum allocation should be available at the same time in low band, mid band and high band.

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Dr Ir. Ismail

Director General of Spectrum Management and Standardization of Post and ICT, Indonesia's Ministry of Communication and Information Technology

20th ITUGSR EDITION ONLINE 2020

GSR SESSIONS-DAY 2

IT IS AN EQUATION...
 QUALITY OF STATIONS
 + EFFICIENCY
 + SPECTRUM ABUNDANCE

DIGITAL CONNECTIVITY IS ESSENTIAL FOR SOCIETY

THE VALUE OF SPECTRUM IS AN OUTPUT NOT AN INPUT!

SPECTRUM VALUATION AND ALLOCATION MECHANISMS

IF WE BEGIN WITH CERTAINITIES WE SHALL END IN DOUBTS
 BUT IF WE BEGIN WITH DOUBTS AND ARE PATIENT WITH THEM WE WILL END WITH CERTAINITIES
 FRANCIS BACON

1 TECHNOLOGY CAN MEET GLOBAL CONNECTIVITY NEEDS

HOW DO WE GET VALUE TO THE END USER?
 DIGITAL CONNECTIVITY MUST BE AVAILABLE TO ALL

TAXES ARE AN OBSTACLE TO THE DEVELOPMENT OF NETWORKS
 4 KEY PILLARS

SPECTRUM FREQUENCY IS A RARE RESOURCE
 5G NETWORKS SHOULD BE PUT IN PLACE TO KICKSTART THE 4TH INDUSTRIAL REVOLUTION

LESSONS LEARNED FROM COVID-19
 SPECTRUM IS KEY IN DIGITAL TRANSFORMATION
 WHAT MATTERS MOST IS CLOSING THE DIGITAL DIVIDE
 SPECTRUM AS STATE INCOME GENERATOR OR A LONG-TERM INVESTMENT?

PEOPLE HAVE MOVED THEIR LIVES ONLINE
 THERE HAS BEEN A 40% RISE IN INTERNET USAGE IN THE US
 SPECTRUM IS A SCARCE RESOURCE WHICH NEEDS TO BE USED EFFICIENTLY

THERE NEEDS TO BE A NETWORK OF NETWORKS
 TECHNOLOGY NEUTRALITY IS NOT THE SAME AS TECHNOLOGY EQUALITY!

EARLY INVESTMENT TO PUT THAT CONNECTIVITY IN PLACE IS IMPORTANT!

INFRASTRUCTURE CUT RED TAPE
 SPECTRUM
 UNIVERSAL SERVICE
 LIGHT TOUCH REGULATION



He also suggests that the availability of fibre optic needs to be accelerated. The lack of fibre optic will cause 5G development to be costly and ineffective, he warned, as the user may not experience the full promise of 5G. At the same time some operators may have to pay high fees for spectrum.

Considering the public interest in spectrum use and allocation

The pandemic itself has demonstrated the strong public interest in ensuring global connectivity to each and every home and business, from the most urban to the most rural. This is why for Jennifer Manner, Senior Vice President of Regulatory Affairs at Hughes Network Systems, the pandemic made crystal clear the need for considering the public interest and the divisions on the allocation and use of spectrum.

During the pandemic all operators, whether terrestrial or non-terrestrial, satellite or mobile wireless, have had to meet demands, explained Manner, and therefore: "the pandemic demonstrated that no one technology is/ or can be the solution to global connectivity needs."

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The pandemic demonstrated that no one technology is/ or can be the solution to global connectivity.

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Jennifer Manner

Senior Vice President of
Regulatory Affairs, Hughes
Network Systems

According to Manner, a network of networks is required, so that all technologies can deliver connectivity to meet user needs. For example, "during the pandemic satellite operators such as Hughes were able to activate services to users at their homes, in hospitals, and schools in a matter of a couple of days, even without any terrestrial infrastructure," she said. "And service providers responded in their own way – all bringing the connectivity to the world's population," she added.

For Manner, this means that "as regulators look to the future, they must be technology neutral in making the decisions that will best serve the public interest and ensure connectivity to everyone,

no matter where they are." This she said would entail regulators analysing the public interest, and spectrum allocation and usage decisions to ensure decisions are technology neutral.

Factoring in the value of unlicensed vs. licensed in spectrum allocation

Jayne Stancavage, Global Executive Director of Digital Infrastructure Policy at Intel Corporation spoke about how to factor in the value of unlicensed versus licensed when allocating spectrum.

"When we look at factors like spectrum valuation, there are a number of things to take into account," said Stancavage.

First there is a need to look at the deployment scenarios: whether 1) the spectrum is going to be cleared for use; 2) it is shared spectrum with geographical restrictions; or 3) it is not going to be cleared at all for licensed use.

Stancavage highlights the need to look at propagation; cell sizes, the markets served, urban/rural, and what type of revenue can be generated from the factors.

Also to consider is the amount of spectrum and the capabilities it would provide, the technical requirements that are placed on it and the build-out requirements.

Lessons on investment

Stephen Pentland, Head of Spectrum, Public Policy at Vodafone Group points out that the challenge is simply getting all customers connected digitally. "How do we get the investment into networks to make sure our customers, wherever they happen to be, and of course their locations are changing during this pandemic, to make sure they can be connected so they can continue to work, or continue their education, or continue to shop, and so on?"

Pentland explains that in markets that have struggled with spectrum capacity, regulators have generally been moving to make spectrum available on a temporary basis. "The number one lesson is that if there is spectrum available, make sure that it is on the market and able to be put to use, and that investment can flow strongly," says Pentland.

Pentland shared with the audience a simple lesson from the fixed world of providing gigabit access to remote communities in Ireland to allow people to work remotely, without having to move to the big cities such as Dublin or Cork. Learn more about the [Gigabit Hub Initiative](#).

"Three and a half years later, we are all thanks to COVID having to work in our remote communities and achieve this gigabit connectivity," said Pentland. "Investing early and putting that connectivity in place is important. It is important in fixed – and it's also important in mobile," he added.

Telecommunications for emergency situations

Mustapha Bessi, Head of the Frequency Spectrum Management Division of the Moroccan regulator *Agence Nationale de Réglementation des Télécommunications* (ANRT) said: "The COVID-19 crisis calls upon us to include new components in development strategies, namely telecommunications for emergency situations."

Bessi stressed the importance of access to very high throughput bandwidth to ensure that populations have access to basic services, and that emergency services can get through.

He also pointed out the important role that emerging technologies and new next-generation networks like 4G and 5G can play. "In addition to high throughput these technologies allow for quick deployment," he said.

Bessi warned that despite the progress to date, in many countries digital transformation is either blocked or moving forward very slowly due to various factors like technical constraints, and/or [lack of] access to telecommunications. This is especially true in rural areas, he said.

Bessi also sees that taxes are sometimes an obstacle to network development. "I think that determining these taxes should be based on very careful studies by countries, and by regulators, and should be aimed at facilitating the development and deployment of networks", said Bessi. ■



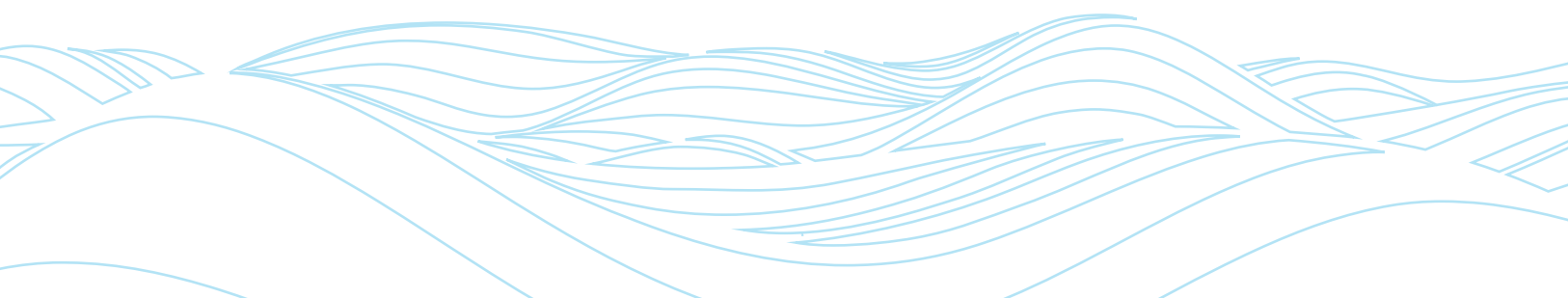
From security to resilience: Reimagined regulatory approaches for a brave new digital world

By ITU News

■ COVID-19 has radically shifted the context of the global digital safety and security conversation. Amid the global pandemic, many of us have had to live our lives through digital means. But as more digital services are brought online faster than ever before, what are the safety and security repercussions? In other words, what needs to be done differently – from a regulatory context – in a post-COVID digital world to keep us safe and secure?

A number of bold ideas on how to keep infrastructure, networks, people and things safe and secured at all times in a post-COVID digital environment came from the [GSR-20](#) core session on digital safety and security.

Moderated by Americo Muchanga, Chairman of the Communications Regulator Authority of Mozambique (INCM), panellists discussed how to best design and execute cyber-security preparedness measures for policy consideration and risk mitigation, taking into consideration lessons learned from the pandemic.



"A new body of knowledge has come up from COVID-19," said panellist Zulkarnain Mohd Yasin of the Malaysian Communications and Multimedia Commission (MCMC), noting the unprecedented "window of opportunity to collaborate, rethink strategy and approach to address gaps."

The way we use tech has changed

Over the past six months, COVID-19 has completely changed the way we use technology the world over. What are those differences? In addition to huge shifts in volume and traffic patterns, Derek O'Halloran of the World Economic Forum offered some telling statistical insights, including a 70 per cent increase in Internet use worldwide, a 200 per cent in the use of commercial apps, and a 300 per cent increase in the use of virtual collaboration tools such as Microsoft Teams. When it comes to streaming apps like Zoom or home entertainment platforms, we have seen a 2000 per cent increase, noted O'Halloran.

Regulatory initiatives have also influenced these behavioural changes in digital uptake and a more widespread use of information and communication

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A new body of knowledge has come up from COVID-19.

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Zulkarnain Mohd Yasin

Malaysian Communications and Multimedia Commission

technologies (ICTs) around the world. According to Hannia Vega of Sutel, zero-rating was implemented in Costa Rica to keep citizens connected, while vulnerable populations received a 20 per cent subsidy. In addition, the national telecom fund helped pay three months' worth of Internet costs to enable business continuity for micro-enterprises, she said.

A dramatically bigger attack surface

The downside to this widespread ICT uptake is a much bigger attack surface in terms of cyberthreats and cybersecurity risks. "Attackers and bad actors are cognizant of this and taking advantage," warned O'Halloran.

In full agreement, Yasin noted how "in this Internet age, cyber-criminals share information [and] exchange notes. [While] regulators, and law enforcement agencies, they don't share information so there are gaps in terms of intelligence."

It's not that we are seeing new types of attacks, O'Halloran added. "We see more of some types and less of others. For example, we are seeing increasing APT threats, a dramatic increase in anything that is around social engineering: advantage of new context, very targeted phishing and related attacks to get people to open doors into networks unintentionally." According to O'Halloran, the biggest focus needs to be placed on these areas.

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Attackers and bad actors are cognizant of this and taking advantage.

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Derek O'Halloran

World Economic Forum

For Steve Harvey of BitSight, the real challenge is a lack of data visibility into threats. Since a great deal of infrastructure is privately owned, governments often lack visibility into the security posture of critical infrastructure, he said.

Doing things differently: Regulatory approaches for a post-COVID digital era

When it comes to a top-down or bottom-up approach, panellists agreed that while there is no silver bullet, a spirit of collaboration and cross-sectoral cooperation is vital in addressing security and safety in the post-COVID digital era.

While it is hard to reduce the threat environment, we can reduce attack surface with clear data on where problems lie, said Harvey. For example, ITU and Bitsight partnered to

offer free access to BitSight's security performance platform so that Member States can identify ongoing malicious activities against national health services and infrastructures vital to COVID-19 responses.

Natasha Jackson of GSMA suggested working harder to enforce what we already know, especially in terms of security by design. She stressed the importance that "all companies, large, small, and ones developing new tech, embed [security] questions into design processes."

20th EDITION ITUGSR ONLINE 2020

GSR SESSIONS-DAY 3



“

All companies, large, small, and ones developing new tech, embed [security] questions into design processes.

”

Natasha Jackson
GSMA

Insights from the Internet Society's work on how to balance or calibrate efforts to regulate were brought to the discussion by Joseph Hall, who cautioned against weakening encryption. "We don't design infrastructure around criminality," he pointed out. "Imagine if we created sidewalks that crumbled underneath the feet of criminals. We could suffer serious problems if all sidewalks crumbled at once!" According to Hall, the best way to ensure security is to adopt policies that support rather than undermine strong encryption.

Towards post-COVID resilience: Digital transformation and security in lockstep

Don't let security issues stop you from pursuing digital transformation, cautioned O'Halloran. "If you don't start rolling out digital services, you've got nothing to secure. You have to do it along the way," he affirmed. "We need to advance digital transformation with security as one of the key design parameters for everything we do," said O'Halloran, echoing Jackson's earlier point.

Emerging economies that may not have the resources to invest in cutting-edge cybersecurity should "look at this as a new window of opportunity for regulators to address digital access and literacy," suggested Yasin. The representative of the Malaysian regulator went on to share a real-life example of collaboration with other regulators as well as the Malaysian national security council.

"We have to act as one government, a whole of government ecosystem," affirmed Yasin. O'Halloran agreed, adding that regulators "can't just give [the responsibility of security] to one agency or task force and ask when it's done, that's not the nature of the challenge."

Perhaps security should be a public good – like we have today in the physical world, suggested Jacques Francoeur, Chief Scientist and Founder of Cyber and International Communications and Information Policy (CIP).

The main message and key takeaways of the session were perhaps best summed up by O'Halloran, on the need to pursue resilience through a collaborative, partnership-driven model of regulation. "Resilience is not just about building bigger walls to strengthen security, but a differentiated approach that considers most valuable assets and important services, different risks (both intended and unintended) and the people, process and technology needed to mitigate most important risks and recover quickly," he said. ■



Better inclusivity: Leaving no one behind in the digital age

By ITU News

■ Innovative approaches can facilitate the digital transformation process for everyone and ensure access to basic and specialized information and communication technology (ICT) education and training programmes for all, including e-learning tools, which aim to leave no one behind.

At the same time, policy measures and regulatory tools can support inclusion, that means everyone, including persons with disabilities.

But, how can we ensure that information and communication technologies (ICTs) are accessible to everyone in what is fast becoming the digital age, and in a time of pandemic?

Participants at a [GSR-20](#) panel session entitled “Sustainable and inclusive societies, accessible ICTs to leave no one behind”, tackled this and other questions and highlighted what they are doing differently to ensure digital inclusion for everyone.

The panel session was chaired by Michel Van Bellinghen Chairman of *Institut belge des services postaux et des télécommunications* (IBPT) and incoming Chair of BEREC.

Mobile connectivity – a success story in Afghanistan

Hamidullah Sherani, Board member of the Afghanistan Telecom Regulatory Authority (ATRA) noted how Afghanistan's geography is unique in that it is a very mountainous country with a dispersed population, making some areas difficult to reach.

Despite this and other challenges such as digital illiteracy, Sherani noted that GSM connectivity has been a success story in Afghanistan. He highlighted the provision of Internet and connecting schools for special needs children, setting up digital literacy labs, and services for nomads who live in remote areas and travel around the country. To enhance financial inclusion within cities, Afghanistan has also been working on mobile money and making the move to a cashless society.

Sherani points to what he sees as one of the challenges: "We didn't have an e-transaction law, which was actually creating problems for developing a digital ecosystem and digital economy," he said. Fortunately, he said the [draft law](#) was recently approved which will make e-transactions much easier.

For gender inclusion, in December 2019, the Ministry of Communications and Information Technology launched an [Empowerment Training Program For Women in the Digital Era](#).

Iraq's regulatory measures to provide services in remote areas

Dr Ali Naser Al-Khwildi, Head of Iraq's regulatory authority, the Communications and Media Commission (CMC), explained how CMC has been working to support the Iraqi "Dom 2025" initiative for advancement of the information and communication telecommunication technology (ICT) sector. This will have a significant impact on the economy and the services provided to citizens.

The goal is to provide Iraqi citizens with access to all modern ICT services and applications which are essential to economic and social integration. "Several projects in remote areas have been implemented to ensure the accessibility of ICT services and applications to households, schools, and disabled people," explained Al-Khwildi, while another set of projects will be implemented in the near future, including broadband services.

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Several projects in remote areas have been implemented to ensure the accessibility of ICT services.

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Dr Ali Naser Al-Khwildi

CMC, Iraq Communication and Media Commission, Iraq

Access to education in Portugal

João António Cadete de Matos, Chairman of Portugal's *Autoridade Nacional de Comunicações* (ANACOM), shared the regulatory tools and plans to be introduced in Portugal to improve inclusiveness and access to education to leave no one behind.

Efforts in 2020 in Portugal are very important in the context of the pandemic crisis, said Cadete de Matos, outlining two initiatives: Firstly, widening the TV broadcasting service to include everyone. This involves migration of the digital terrestrial television (DTT) to a new band so that Portugal can make the transition to 5G.

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The ultimate goal is to ensure that all the students have the same conditions.

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João António Cadete
de Matos
ANACOM

This is crucial for maintaining access to TV for those people living in remote or rural areas and those who don't have Internet access or are unable to afford access to the service. "This is an important instrument of social inclusion, and also very important for the young generation – for the students," said Cadete de Matos.

Secondly, coordination with the Government on the quality control testing of mobile broadband in schools. "The ultimate goal is to ensure that all students have the same conditions," said Cadete de Matos, recognizing that students without Internet access have a competitive disadvantage to other students.

Portugal is also working with the Government to incentivize mobile operators to improve coverage throughout public schools and to create a social tariff for access to Internet services.

Inclusivity with Smart Africa projects

Lacina Koné, Director-General of Smart Africa shared some measures the company has taken to ensure a sustainable and inclusive society in Africa.

He explained that Smart Africa has developed among other things, building blocks such as policy harmonization, increasing footprint of a cross border digital infrastructure through an inter Africa connectivity project of affordable, accessible and meaningful connectivity. "Also not forgetting the interoperable digital ID – which is really key," says Koné.

Koné pointed out to participants that close to half a billion people in Africa are without an official identity and therefore cannot contribute to sustainable social economic development.

He spoke about the smart city blueprint and smart village blueprint of Niger, which he said had recently received funding from the World Bank for its implementation phase.

Koné believes that by taking these topics through the process of the concept blueprint and pilot, Africa is supporting Smart-Africa member States in developing their own national agendas.

With around 30 member countries, Smart Africa has also established the Council of African Regulators as an engine for implementation of cross-border infrastructure projects.

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Also not forgetting the interoperable digital ID — which is key.

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Lacina Koné
Smart Africa

Avanti's focus on education

Toby Robinson, Chief Commercial Officer (CCO) of Avanti

Communications referred to the subject of digital inclusion as a very timely one, pointing out that over three billion people still don't have access to the Internet. "There are over three billion people in the world who couldn't join us here even if they wanted to," he said.

According to Robinson, there has rightly been a focus on education in these times of COVID crisis. As the United Nations highlighted, the pandemic is deepening the [education crisis](#) and widening existing educational inequalities.

The recent [UNICEF report](#) reveals that 463 million children globally were unable to access remote learning when COVID-19 shuttered their schools. In light of this, Robinson was pleased to announce Avanti's honour in sponsoring [Sustainable Development Goal No. 4](#) dedicated to good education and quality communication.

Satellite – key to connecting the next 3 billion

Referring to the role satellite communications can play in connecting the unconnected, Robinson points out that satellite is only currently 1 per cent of the world's telecom market – seen as a niche, high cost, technology.

However, according to Robinson, with new technologies emerging in the KA band, costs are dropping, which he is confident will enable access to many more people.

"If we are to connect the next three billion, even one billion people, looking at the economics and geography involved, satellite will play a key role if we are to achieve that goal," said Robinson.

While Robinson agrees that fibre and 5G are key – he urges ITU and the broader community to think more about the role that satellite can play, to connect the next three billion.

Giving disabled users a voice

KR Liu, Head of Brand

Accessibility at Google, stressed the importance of the design process when asked about the barriers to unlocking further innovation and growth in the ICT ecosystem for the performance of people with disabilities.

"It is not about designing for someone. It is absolutely about designing with someone," she said, pointing out that people make assumptions about what people with disabilities need or want which often leads to incorrect design, wasted resources, or a less than ideal product for individuals with disabilities.

Liu also says that collaboration across disciplines and experiences is important, especially in the ICT ecosystem, and told the panel participants: "We see plenty of companies that start out as a group of engineers who thought they knew what exactly to build to address a disability, but where were the designers? Where were the clinicians and first line medical staff that work with patients every day? But most importantly, where were the individuals with disabilities who have firsthand experience with a particular disability?"

When collectively coming together to support an initiative around disabled people and with disabled people, Liu advocates for better articulating the proven concept that the development of ICTs for the disability community can in fact serve everyone.

"We make sure our disabled users have a voice, are seated at the table, are designing in our marketing and in our innovation process," said Liu.

Cross-cutting measures to leave no one behind

Dr Mercedes Aramendía, President of Uruguay's regulator, *Unidad Reguladora de Servicios de Comunicaciones* (URSEC), spoke about the important role the regulator plays to ensure the use of information and communication technology (ICT) services, to ensure investment to protect users, to promote competition and to guarantee non-discriminatory application.

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I think it is absolutely critical that we are all part of this movement and that no one is left behind.

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Dr Mercedes Aramendía
URSEC, Uruguay



Aramendía highlighted the need for the regulator to work across the whole ecosystem, at both the national and international level to assess, evaluate and control the legal framework to ensure that the conditions in place are adequate, and fit-for-purpose, and reflect the reality that is needed today.

She thought it very important to highlight that telecommunications contribute directly to accelerate the progress of the human race, saying that “more than ever, we need to have universal access in place, access to information which is absolutely critical for sustainable development, such as education, teleworking, e-health, and e-commerce.”

“I think it is absolutely critical that we are all part of this movement and that no one is left behind,” said Aramendía. “To develop the [ICT] ecosystem, we have to adopt cross-cutting measures, to collaborate and to coordinate and to work together, to ensure that we have sustainable societies, and to ensure that no one is left behind,” she concluded. ■



The Global ICT Regulatory Outlook 2020

At GSR, ITU presented [The Global ICT Regulatory Outlook 2020](#), which benchmarks regulatory progress across no fewer than 193 countries worldwide.

In three years, the report has established itself as the go-to reference for regulators and policymakers seeking to shape meaningful, regulatory change that will benefit all.

Take a look at the report.

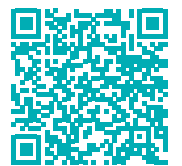


ICT Regulatory Tracker

The ICT Regulatory Tracker is an evidence-based tool to help decision-makers and regulators make sense of the rapid evolution of ICT regulation.

The tracker helps track progress and identify gaps in regulatory frameworks, making the case for further regulatory reform towards achieving a vibrant and inclusive ICT sector.

You can access the ICT Regulatory Tracker [here](#).



Join ITU's online communities on your favorite channel

Regulating for digital transformation in Europe and CIS

By Jaroslaw Ponder

Head of the ITU Office for Europe; and

By Natalia Mochu

Regional Director, Regional Office for CIS

“In a world where digital increasingly lies at the heart of all we do, collaborative cross sector regulation is the best and quickest way to leverage the digital transformation and deliver meaningful connectivity and inclusive digital markets,” said Doreen Bogdan-Martin, Director of the ITU Telecommunication

Development Bureau, as she welcomed participants of the Global Symposium for Regulators (GSR-20) Regional Regulatory Roundtable Discussion for Europe and the Commonwealth of Independent States (CIS): [The Regulatory Wheel of Change](#), which was held remotely on 7 July.

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In a world where digital increasingly lies at the heart of all we do, collaborative cross sector regulation is the best and quickest way to leverage digital transformation...

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Doreen Bogdan-Martin

Director of ITU's
Telecommunication
Development Bureau

More information on the roundtable, including the outcome report, is available [here](#).



With a diverse group of representatives from regulatory organizations, including the Body of European Regulators for Electronic Communications (BEREC), the EU and EaP Electronic Communications Regulatory Platform (EaPeReg), the European Mediterranean Regulators Group (EMERG) and the national regulatory authorities from Europe and the Commonwealth of Independent States (CIS), the webinar explored the role of regulators in safeguarding an environment for the development of resilient and secure digital connectivity for all.

Consultation leading to GSR Best Practice Guidelines

Based on the challenges and experiences of collaborative regulation, radio frequency spectrum management, as well as digital safety and inclusiveness, the webinar provided a unique opportunity for presenting the consultation process leading towards the elaboration of the GSR Best Practice Guidelines.

As the GSR-20 Chair, Dan Sjöblom, Director General of the Swedish Post and Telecom Authority (PTS) and Chair of

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The webinar provided a unique opportunity for presenting the consultation process leading towards the elaboration of the GSR Best Practice Guidelines.

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Jaroslav Ponder and Natalia Mochu

BEREC, set up the context for discussion among participants by reminding the audience of the vital role of GSR Best Practice Guidelines in helping regulators accelerate inclusive growth of information and communication technology (ICT) in the region.

Sjöblom noted that the ongoing COVID-19 pandemic offers regulators a learning opportunity and a call for action toward increased collaboration between regulatory bodies and all stakeholders both nationally, and around the world.

Divided into two major sessions that addressed current trends and national regulatory approaches in fostering post-COVID-19 digital

transformation, the webinar benefited from interventions and expertise from regulators from countries in the region.

Sharing views, shaping policy

“Sharing views, ideas, and experiences of regulatory authorities is important, since it allows participants to consider not only the existing connectivity challenges in the region but also to learn from the best policy approaches capable of enabling the digital economy to grow sustainable and meet social goals,” said Sofie Maddens, Head of Regulatory and Market Environment, ITU.

Some key regional trends highlighted by participants included changes in mobile data packages by telecom operators, adaptation in streaming services for maximizing data trafficking, information on network performance, expansion of broadband access, updates to 5G deployment timelines, information sharing between agencies and countries, as well as the contentious trade-off between protecting end-users and allowing innovation to happen.

How COVID-19 is spurring new approaches

After discussing the key trends in the regions, participants also had the opportunity to share specific national regulatory approaches to post COVID-19 digital transformation, thus exploring challenges and opportunities for what lies ahead in terms of ICT regulation.

A common thread from the roundtable discussions was the fact that the COVID-19 pandemic became indeed an accelerator of new initiatives and projects to address the new kinds of shifts in societal values that COVID-19 has caused.

As a result, these shifts shape the kinds of demands for ICT services that are currently offered and regulated, challenging operators to accelerate their activities, supply chains, coverage, and cycles of innovation.

Extension of payment deadlines as well as the expansion of data collection on network load and capacity are a few examples of such initiatives.

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Such collaboration will help new regulatory approaches to get the support from the policymakers to accelerate inclusive growth of ICTs.

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Dan Sjöblom

Chair of GSR-20, Director-General of the Swedish Post and Telecom Authority (PTS), and Chair of BEREC

Both sessions also addressed a variety of trends that reflected the relevance of coordinating strategies with telecom providers amid emergencies such as a global pandemic.

Moreover, they also shed light on the fact that telecommunications is a cornerstone of a much broader digital ecosystem that includes not only providers and regulators, but also end-users who help shape the industry going forward.

Among other things, this scenario provides opportunities to explore new ways of fostering more effective collaboration across sectors, as well as promote cooperation across borders.

All in all, the expected output of this GSR's Regional Roundtable Discussion, coupled with the engaging participation of regional organizations and national regulatory authorities, exemplifies the growing importance of uniting forces and synergies. Such collaboration will help “new regulatory approaches to get the support from the policymakers to accelerate inclusive growth of ICTs contributing to socio-economic development,” said Sjöblom.

ITU Regional Initiatives for the Europe and CIS regions offered an excellent opportunity for building upon the outcomes of GSR-20, including the Best Practice Guidelines, while providing expert and technical assistance, adapting countries' regulatory environment to foster the development of a gigabit society, resistant to natural hazards, including pandemics, such as COVID-19. ■

See also the GSR-20 Discussion Paper on Pandemic in the Internet Age: Communications Industry Responses [here](#).





Exploring digital transformation in Asia-Pacific

By Sameer Sharma

Senior Advisor to ITU's Asia-Pacific Regional Office

■ Amid the COVID-19 pandemic, countries in the Asia-Pacific region are forging ahead with their respective digital transformations. While this process and its policy environment may look different in each Asia-Pacific nation, the end goal is the same: prosperous economies and societies in an increasingly digital world.

With this shared objective in mind, the webinar [Digital Transformation for Digital Economies @COVID-19 South Asia](#) was held as part of the 20th Global Symposium for Regulators (GSR-20).

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Amid the COVID-19 pandemic, countries in the Asia-Pacific region are forging ahead with their respective digital transformations.

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Sameer Sharma

More information on the roundtable, including the outcome report, is available [here](#).



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Speakers highlighted digital strategies and innovative solutions adopted in response to connectivity challenges.

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Sameer Sharma

The virtual event featured concrete recommendations designed to help regulators, policymakers and industry leaders in Asia and the Pacific to better understand the digital transformation in their region and what tools can create enabling policy environments despite the challenges posed by the global pandemic.

Organized by ITU in partnership with the Telecom Regulatory Authority of India (TRAI) and GSMA, representatives from national regulatory authorities, the private sector and other stakeholders came together to share experiences and to advance discussions on easing regulations in order to fast-track digital transformation in the post-COVID-19 era.

Speakers highlighted digital strategies and innovative solutions adopted in response to connectivity challenges and the need for digital connectivity in areas like health, education, work-from-home, which have emerged amid the crisis.

Doreen Bogdan-Martin, Director of the ITU Telecommunication Development Bureau, highlighted how the digital sector seems certain to play a strong role in Asia-Pacific's post-COVID recovery, with the shift of economic activity to the cloud and the need for mobile trace and other tech solutions benefiting a great many Asian countries which already have a very strong presence in the digital economy.

“The rise in demand for digital applications, combined with enabling policies designed to support the tech sector across the region, could spur digital innovation and boost digital entrepreneurs, further improving regional growth and development prospects,” she said. “But let’s always remember that Asia is a region of strong contrasts. Not every country is positioned to take advantage of a surge in demand for technology.

So, as we make our plans to leverage ICTs for a tech-led recovery, it is imperative that we ensure that all countries benefit, and that no-one is left behind.”

COVID-19 recovery: From crisis to opportunity

The event also featured a report on the impact of COVID-19 in South Asia as a part of the UNESCAP Framework on Socio-Economic Response to the pandemic. The report argues that government action should not push a return to the status quo, but rather turn the crisis into an opportunity to create more equal, sustainable, and resilient societies in South Asia, which will aid the sub-region in closing the SDG gaps that are currently present.

“The policymakers, regulators and stakeholders have realized that the digital transformation can be achieved by giving the necessary impetus to their digital infrastructure, strategies and innovative policy initiatives,” said TRAI Chairman Dr R.S. Sharma. “I urge all the ICT regulators, governments and service providers to come together and resolve to take adequate steps in achieving the digital transformation which will enable us to overcome the present pandemic crisis.”

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The Asia-Pacific Regional Initiative on Enabling Policy and Regulatory Environments offered an excellent opportunity for building upon the outcomes of GSR-20.

”

Sameer Sharma

According to Julian Gorman, Head of Asia Pacific at GSMA, “COVID-19 has forced policymakers from even the most advanced markets to reconsider whether enough is being done to modernize telecoms regulatory frameworks and facilitate transformation of economies for an inclusive and resilient digital vision.” He went on to point out how South Asia policymakers must understand the need for a whole-of-government approach to create strong and sustainable foundations supporting digital transformation and a competitive environment that attracts the investment and innovation necessary to deliver it. “Without rapid and meaningful regulatory

reform, nations risk further delays to an inclusive digital future and falling behind the progress seen elsewhere,” said Mr Gorman.

“We welcome ITU’s efforts and the invitation to collaborate on how to best inspire policymakers, to influence a productive dialogue and agree the actions to deliver inclusive digital growth”

The road to seamless connectivity

Another important topic debated was how to best protect people during the pandemic.

Speakers from the region discussed country-specific efforts and challenges while also talking about the way forward on seamless digital connectivity for all. The deliberation focused on how lessons learned from COVID-19 can help hone a stronger response for enhancing connectivity, such as infrastructure sharing. Enhancing cooperation benefits not only national connectivity but also sub-regional connectivity. Promoting affordable access, in particular for landlocked countries, flexible licensing regimes and easier and efficient spectrum allocation strategies are needed for transformation into a digital economy while following the

whole-of-government approach mentioned by Gorman.

Members of industry provided their own insights on analysing and reporting on quality of service, consumers’ real-world mobile network experience at a large scale and spectrum-related issues in the wireless industry, as well as the perspective of social media for enhancing connectivity with a focus on digital inclusion.

All in all, the expected output of this GSR Regional Regulatory Roundtable, coupled with the engaging participation of ITU Member States, national regulatory authorities, and private sector representatives exemplifies the growing importance of uniting forces and synergies.

The Asia-Pacific Regional Initiative on Enabling Policy and Regulatory Environments offered an excellent opportunity for building upon the outcomes of GSR-20, including Best Practice Guidelines, while providing expert and technical assistance, adapting countries’ regulatory environment to foster the development of the gigabit society, resistant to natural hazards, including pandemics such as COVID-19. ■



Innovating digital competition policy in the African and Arab regions

By Ida Jallow

Program Coordinator, ITU Regional Office for Africa

■ How should regulators address competition policy in a rapidly changing digital applications environment, especially when markets are two-sided or even multi-sided?

This question underpinned the third and final regional regulatory roundtable held within the framework of the 20th Global Symposium for Regulators ([GSR-20](#)). Conducted virtually

on 20 August 2020, the [online event](#) enjoyed a strong participation of over 150 attendees from around the world.

Key considerations and vectors of regulatory action

Setting the scene for the main event, Stephen Bereaux, Deputy to the Director of the Telecommunication Development

Bureau, highlighted key considerations for regulation to remain an enabling factor for universal connectivity, within and beyond the African and Arab regions.

These include the maintenance of an environment that promotes innovation, investment and collaboration, updating regulatory rules and processes, and analysing competition policies to ensure positive impact.

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There is never going to be a one-size-fits-all when it comes to ICT regulation.

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Dan Sjöblom

Chair of GSR-20, Director-General of the Swedish Post and Telecom Authority (PTS), and Chair of BEREC

Echoing these insights, GSR-20 Chair Dan Sjöblom noted how the COVID-19 crisis is really a window of opportunity that the regulatory community cannot afford to miss. He also stressed the importance of adaptability when it comes to local circumstances, acknowledging “there is never going to be a one-size-fits-all” when it comes to ICT regulation.

However, this does not mean best practices cannot be exchanged and learned from. This notion was showcased in the GSR-20 Best Practice Guidelines presented by Sofie Maddens, Head of the Regulatory and Market Environment Division at ITU, who emphasized the key vectors of regulatory actions: inclusiveness, agility, and resilience.

The GSR-20 Guidelines were to be adopted on 1st September during the Heads of Regulators executive roundtable.

Dealing with dominant digital platforms and closing the gap

The first session kicked off with a keynote presentation on the evolution of competition policy and regulation in the context of digital markets by ITU expert David Rogerson. The keynote grounded the discussion in the current state of play, characterized by critical regulatory challenges posed by dominant digital platforms.

“Defining markets, determining dominance and identifying anti-competitive behaviours are all made significantly more difficult with digital platforms,” said Rogerson. While platforms have substantially decreased transaction costs, they have also created market concentrations, he said. Yet despite this market dominance, “we are seeing digital platforms eating into the market of traditional telecoms, yet not necessarily making a proportionate contribution to the funding of the infrastructure on which they rely,” he noted.

Next came a panel discussing the evolution of competition policy and regulation in the context of digital markets moderated by Adel Darwish, Regional Director of the ITU Regional Office for Arab States. The conversation featured both global and regional perspectives, including an analysis of global and digital players in the Arab and African regions with an emphasis on national-level implications.

A comment to Rogerson’s keynote came from Facebook’s Africa Director of Public Policy Kojo Boakye, who highlighted the symbiotic relationship between network operators and over-the-top (OTT) media services by pointing out how Facebook’s investments in the Arab and African regions have been made in partnership with mobile operators.

Another important challenge was raised by Marie Amandine Bhika, Assistant General Counsel at Intelsat, who stressed the viability of satellites in closing the digital gap. The digital divide is a significant problem in Sub-Saharan Africa where large swaths of the population have yet to benefit from broadband services.

Regulatory constraints, import taxes, and spectrum fees are impeding the establishment of satellite networks in African countries, she said.

Director General of the Uganda Communications Commission (UCC) Irene Kaggwa Sewankambo noted that in Africa, while locally developed applications exist, most digital apps are foreign. "As you look at competition, you want to make sure you are not blocking the new innovators," she said. "How do you create the space for them, level playing the field to help them get into the market and have a fair chance to compete without being too protectionist?" One way might be to collaborate not within the country but beyond in terms of the African region, she proposed.

Taking a more global perspective, Mani Manimohan, Head of Digital Infrastructure Policy and Regulation at GSMA raised two options to "reset" the competition policy market: apply existing tools more vigorously or seek a possible ex-ante regime to complement existing ex-post enforcement, as experts have been exploring both in the United States and the United Kingdom.

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As you look at competition, you want to make sure you are not blocking the new innovators.

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Irene Kaggwa
Sewankambo

Director General, Uganda
Communications Commission

From ex ante to ex post: Are we there yet?

To kick off the second half of the event, ITU expert Simon Molloy gave an insightful presentation on why telecom companies have been regulated differently from big tech platforms, and why this needs to change. While telecommunication operators were originally owned by governments and market structures were well understood, this was not the case for digital platforms – and nobody wanted to get in the way of innovation, explained Molloy, suggesting the complex structure of two-sided and multi-sided markets led to a hands-off regulatory approach. Size and scale are an issue, he suggested,

"because with that sort of scale comes enormous economic and political power."

Moderated by Andrew Rugege, Regional Director of the ITU Regional Office for Africa, the ensuing panel posed the important question of the status of regulation between ex-ante and ex-post, delving into progress made in different African and Arab countries so far.

Bridget Linzie, Head of Electronic Communications at the Communication Regulator of Southern Africa (CRASA) shared research that identified major bottlenecks that are proving to be competitive constraints: increase in IP interconnections, consumer lock-in in Internet of Things (IoT), and the development of OTTs and their impact on competition policy.

Director General of the Rwanda Utilities and Regulatory Authority (RURA) Patrick Nyirishema shared his country's pragmatic and "less prescriptive" regulatory approach, in which RURA has separate departments for the telecommunications industry and that of emerging technologies, including digital platforms. Rwanda has instead focused on building a "vibrant local innovation ecosystem," he said.

Ali Alhadji, Permanent Secretary of the Assembly of Telecommunication Regulators of Central Africa (ARTAC), highlighted the need for regulators to catch up with rapidly developing technologies such as mobile money networks, to which many Africans are now connected. He explained how ARTAC, in its efforts to “harmonize regulation”, continues to benefit from the support of the African Union as well as the investment of the United Nations in the sub-regions.

From Bahrain, and representing the Gulf Cooperation Council (GCC), Saeed Ahmed Mashkoor explained why his country decided to remove the exact regulations for two markets: competitive pressure from OTTs. The emergence of digital applications has elicited “one of the key changes in consumer behaviour and competition landscape,” he said.

Laminou Elhadji Maman, Secretary General of the West Africa Telecommunications Regulators Assembly (WATRA), stressed the need to “look for a new way to regulate,” citing the lack of regulatory control in the

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The emergence of digital applications has elicited one of the key changes in consumer behaviour and competition landscape.

”

Saeed Ahmed Mashkoor
Representing the Gulf
Cooperation Council

digital applications space in Africa and beyond. “If we cannot have a global regulatory body, maybe we can develop closer collaboration to learn from others,” he suggested.

Towards bold, collaborative, and innovative regulation

We have tended to consider competition policy and digital apps separately, so it’s exciting to consider them together and learn more, said CRASA Executive Secretary Antony Chigaazira

during his opening remarks. After all, “digital transformation is not an option,” he insisted. “It is a matter of urgency.” That’s why, as Mr Molloy highlighted, “regulators need to be bold... [and face the] enormous pent-up demand of regulatory innovation.”

Acting regionally in a collaborative manner as exemplified in the regional roundtable is therefore necessary, and the potential for learning should not be underestimated. To borrow the closing words of Rogerson following his keynote:

“The regulation of digital platforms will certainly be needed, but it will have to be conducted at a national level and involve the kind of collaborations that were discussed in this session, both regionally and globally. And in that there is a key role for the ITU, there is a key role for regional regulatory associations, represented in this forum today. And there is a chance for developing countries to learn from the work that is being conducted elsewhere – to sit on the shoulders of others, as it were.” ■

Digital Regulation

The Digital Regulation [Platform](#) and the Digital Regulation [Handbook](#) are the result of ongoing collaboration between the World Bank and ITU.



Digital Regulation Platform

The Digital Regulation Platform provides an update on the basics of information and communication technology (ICT) regulation in light of the digital transformation sweeping across sectors and also includes new regulatory aspects and tools for ICT regulators to consider when making regulatory decisions.

See the platform



Digital Regulation Handbook

The Digital Regulation Handbook aims to provide practical guidance and best practice to policymakers and regulators across the globe concerned with harnessing the benefits of the digital economy and society for their citizens and firms.

Download the Handbook



Watch the video



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How ITU standards address service quality from a regulator's perspective

By ITU News

■ The events of 2020 have brought into focus the importance of reliable, always available information and communication technology (ICT) services. ITU standards for ICT quality assessment support government and industry's work together to achieve this reliability.

Regulators are playing an important part in the standardization work of [ITU-T Study Group 12](#), ITU's expert group for "performance, quality of service (QoS) and quality of experience (QoE)".

**Regulators
are playing
an important
part in the
standardization
work of ITU-T
Study Group 12.**

To learn more about ITU-T Study Group 12, visit the [group's homepage](#).



Recent years have seen a marked increase in regulators' participation in ITU standardization work for performance, QoS and QoE.

The quality-assessment standards developed in the ITU Telecommunication Standardization Sector (ITU-T) Study Group 12 address the full range of ICT services, networks and devices. These include speech, audio and video over fixed and mobile networks, to emerging services in fields such as virtual reality (VR), cloud gaming, 360-degree immersive experience, fintech, and smart mobility.

Working together in ITU standardization enables regulators and industry players to develop sound Key Performance Indicators for service quality.

Developed and agreed by consensus – driven by contributions from regulators, industry and academia – ITU quality-assessment standards aim to provide

all market players with a common view of service quality, supporting broader efforts to build user confidence and trust in ICTs.

Regulators from developing countries are especially well represented in ITU-T Study Group 12.

The [Quality of Service Development Group](#) within ITU-T Study Group 12 offers a platform dedicated to dialogue around QoS and QoE standards' contribution to ICT development.

The group ran a series of open webinars in place of its annual August meeting, with regulators leading the discussions. Here are the [webinar archives](#).

Service quality strategies for regulators

Recent years have seen a marked increase in regulators' participation in ITU standardization work for performance, QoS and QoE.

ITU membership affirmed their support for this trend at the ITU World Telecommunication Standardization Assembly 2016 (WTSA-16) in Hammamet, Tunisia, with the adoption of WTSA Resolution 95 "[ITU-T initiatives to raise awareness on best practices and policies related to service quality](#)".

ITU E.805 "[Strategies to establish quality regulatory frameworks](#)" is a new type of ITU standard addressing ICT service quality from a regulator's perspective. Released in December 2019, ITU E.805 responds directly to WTSA Resolution 95.

ITU E.805 covers subscription voice, video or IP-based communication. It provides a reference on service quality regulatory frameworks suitable for assessing, comparing and giving transparency to the quality achieved by a service, quality as perceived by the end-user, and end-users' degree of satisfaction with service providers.

ITU E.805 takes a high-level view of regulatory approaches to QoS and QoE as well as enforcement strategies to improve quality where required. The standard also focuses on strategies to empower end-users to make informed service choices based on a clear view of the service quality on offer.

ITU E.805.1 “[QoS operational strategy for improved regulatory supervision on providers of mobile telecommunication services](#)” achieved first-stage approval (‘determination’) in September 2020.

ITU E.805.1 builds on the high-level approaches described by ITU E.805 to provide in-depth recommendations on the operations required to implement quality assessment and enforcement strategies.

The standard aims to help regulators achieve their mobile QoS goals at reduced regulatory effort and improved operational efficiency. It will support regulators in increasing the cost-effectiveness of mobile QoS supervision and the speed of the QoS assessment and enforcement loop, without compromising on the reliability of QoS assessment outcomes.

Regulators leading QoS measurement campaigns play an important part in the development and implementation of ITU standards to monitor the performance of IP-based services and the QoS of mobile networks.

Monitoring the performance of IP-based services

Regulators leading QoS measurement campaigns play an important part in the development and implementation of ITU standards to monitor the performance of IP-based services and the QoS of mobile networks.

Regulators benefit from a key 2019 revision of the ITU standard for IP service performance assessment, ITU Y.1540 “[Internet protocol data communication service – IP packet transfer and availability performance parameters](#)”. ITU Y.1540 defines IP-layer capacity parameters in ways that cater to performance assessment, also providing requirements for methods of measurement of IP-layer capacity.

A new Supplement ([ITU Y. Suppl.60](#)) provides guidance on the interpretation of measurements taken with the ITU Y.1540 methodology and also describes an open-source implementation of the methodology.

ITU E.806 “[Measurement campaigns, monitoring systems and sampling methodologies to monitor the quality of service in mobile networks](#)”, released in June 2019, describes a baseline framework of best practices for measuring QoS in mobile networks. It provides a high-level overview of measurement campaigns, the characteristics and requirements of associated monitoring systems, and general recommendations on data processing and sampling methodologies.

ITU E.804 “[Quality of service aspects for popular services in mobile networks](#)”, released in February 2014, defines QoS parameters and their computation for popular services in mobile networks, services such as voice and video communication and streamed media. The standard summarizes the fundamentals of QoS from the user’s perspective. A new [ITU E.804.1 Application Guide](#) to the ITU E.804 QoS metrics, aiming to support the QoS assessment activities of both regulators and service providers, achieved first-stage approval (‘consent’) in September 2020.

Crowdsourcing QoS

User devices and the ICT equipment serving homes and businesses – and associated software – are becoming faster, more powerful, and better able to perform data collection.

ITU E.812 “[Crowdsourcing approach for the assessment of end-to-end quality of service in fixed and mobile broadband networks](#)”, released in May 2020, describes “the crowdsourcing approach” to end-to-end QoS assessment, the trend towards collecting QoS data directly

from end-user devices such as mobile phones and customer premise equipment.

The development of ITU E.812 was initiated by regulators and advanced together with quality-assessment experts from network operators, vendors, analytics companies, and academia.

For regulators, the collected data can guide efforts to raise consumer awareness around service quality and provide an enabling environment for improvements in network infrastructure. Countries spanning large landmasses are also interested in the potential for crowdsourcing to limit the need for QoS personnel to travel to remote areas.

User devices and the ICT equipment serving homes and businesses – and associated software – are becoming faster, more powerful, and better able to perform data collection.

Crowdsourcing delivers significantly more data points. More data leads to more technical parameters to inform QoS assessment, and more potential to improve the reliability and representativeness of assessment results.

ITU E.812 describes how different approaches to crowdsourcing yield different views of QoS. It outlines the different crowdsourcing approaches available to assess end to end QoS on both fixed and mobile broadband networks, approaches without need for modifications to existing hardware and software.

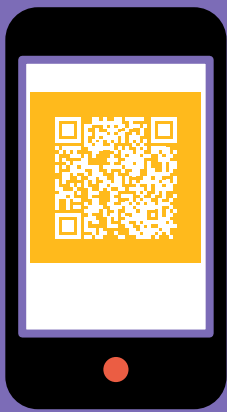
A soon-to-be-published [Amendment to ITU E.812](#) adds appendices providing a detailed view of crowdsourcing use cases.



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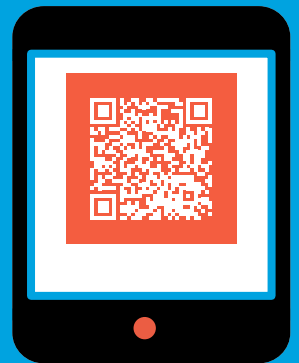
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