



**GSC** | 22  
MONTREUX, SWITZERLAND





Setting the standard

# Snapshot of ITU standardization activities

## Chaesub Lee, ITU





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# Regulatory Framework, WRC-19

- 1.13
- 1.14
- 1.15
- 1.16



**Fix. & Mob. BB Apps**  
 (24.25 < IMT < 86 GHz,  
 HAPS, Apps.Id>275 GHz,  
 WAS/RLAN @ 5 GHz)

**Maritime (GMDSS  
 modernization (+Sat.),  
 use of radio devices,  
 VDES Sat component)**



- 1.8
- 1.9.1
- 1.9.2

1.1



**Amateur in R1  
 @ 50-54 MHz**  
 (4WW allocation)

**Aeronautical  
 (GADSS needs)**



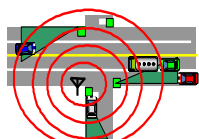
1.10



**Satellite issues**  
 (BSS/FSS @12 GHz,  
 ESIM, regul. for N-GSO  
 FSS @ 37.5 to 51.4 GHz)



- 1.4, 1.5, 1.6



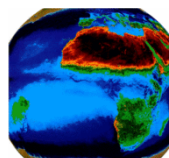
**New Transport  
 systems**

(harmonized bands  
 for railways, ITS)

- 1.11
- 1.12



1.2 **Earth resources &**  
 1.3 **Climate monitoring**  
 1.7 **Weather forecast,  
 DCS improvement, TT&C for  
 N-GSO Sat. of short duration**



**Regulatory issues**

(Sat. regulations,  
 harmonization of  
 spectrum use, etc.)



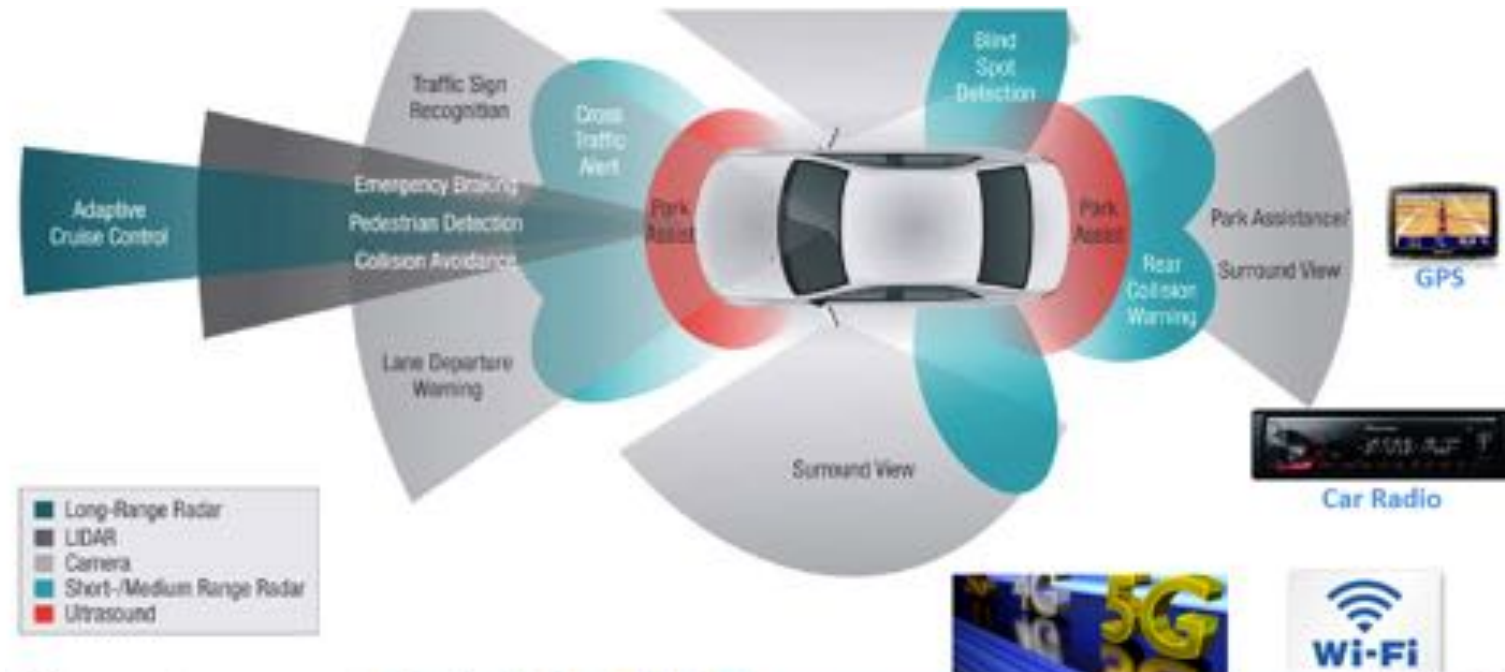
- 7
- 8

➤ Possible solutions to satisfy the issues on the WRC-19 agenda in [CPM Report](#)

*Note: WRC-19 agenda item numbers indicated in italic*



# Spectrum for vehicles



- Radio interface standards of vehicle-to-vehicle and vehicle-to-infrastructure communications for Intelligent Transport System (ITS) applications
- Identification of usage scenarios and harmonization of frequencies and related frequency arrangements for ITS and RSTT (Railway radiocomms Systems between Train & Trackside)





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# ITU-R on IoT, MTC, WPT & EMC/EMI

## ➤ IoT & MTC (machine type communications)

- IoT applications, wired & wireless, using low power wide area networks and optimized mobile and satellite systems
- Harmonization of frequency ranges, technical & operation for short range devices
- Standards for wide area sensor and actuator network systems
- Spectrum for implementation of MTC infrastructures, incl. within IMT standards (4G & 5G)

## ➤ WPT (Wireless power transmission), WPT-EV (electric vehicles)

- Impact studies to protect radiocommunication services (incl. maritime, broadcasting, amateur, aeronautical, etc.)
- Harmonization of frequency ranges for operation of WPT systems

## ➤ EMC/EMI related issues (electromagnetic compatibility/interference)

- Coexistence of radiocommunication systems with wired telecommunication and sources generating RF noise



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# Spectrum and IMT-2020 Standards

## Spectrum

- **Output:** mobile spectrum allocations and IMT identifications
- **Where:** Radio Regulations
- **By whom:** WRCs
- **Contributors:** ITU membership, ITU-R Study Groups, Regional Groups, International organisations
- **How:** Member States driven

## IMT-2020 Standards

- **Output:** IMT-2020 Vision, overall requirements, RAN specifications
- **Where:** ITU-R Reports & Recs approved by member states
- **By whom:** ITU-R Study Group 5
- **Contributors:** ITU membership, other standard making bodies
- **How:** Industry driven

**ITU also develops harmonized channeling arrangements (Rec. ITU-R M.1036 of ITU-R WP 5D)**



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# IMT-2020/5G: Fixed incl. transport

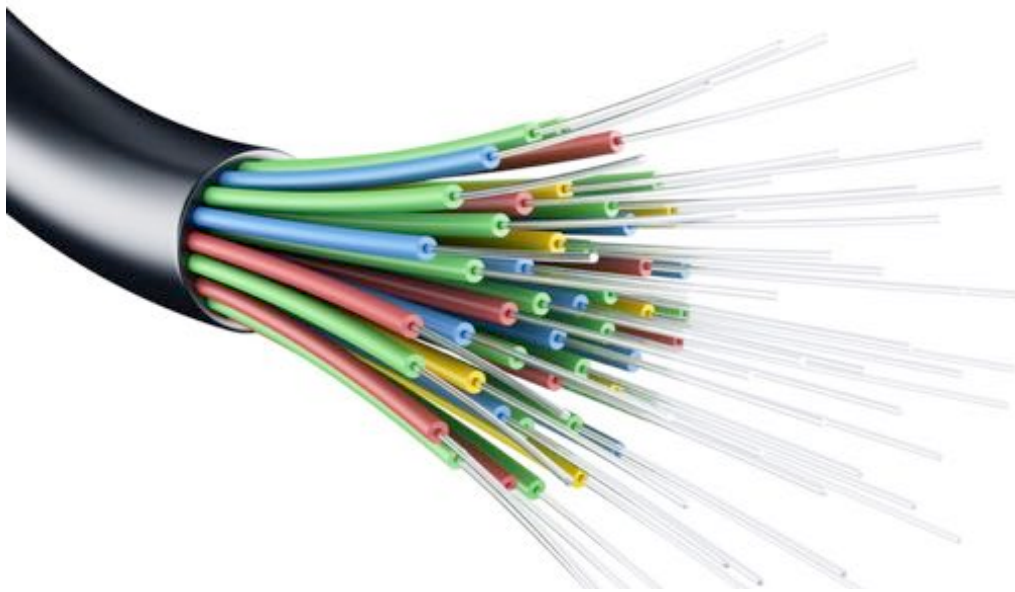


- Network management and orchestration
- Fixed-mobile convergence
- Environmental requirements



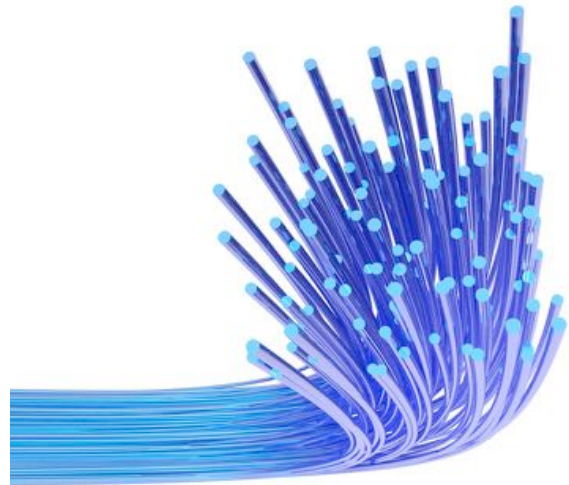
## Updated Technical Report

- captures requirements for Transport Network support of 5G mobile fronthaul, middle-haul, and backhaul
- New ITU standard on synchronization for IMT-2020/5G
- New Supplement on PON support for 5G fronthaul





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## New ITU standards for transport, access and home

- Radio over fibre
- Multi-vendor interoperable 100G coherent DWDM line interfaces
- Fibre-optic cable installation in remote areas
- SDN control of transport networks
- Visible light communications

95%

International traffic runs over fibre-optic networks built on ITU standards

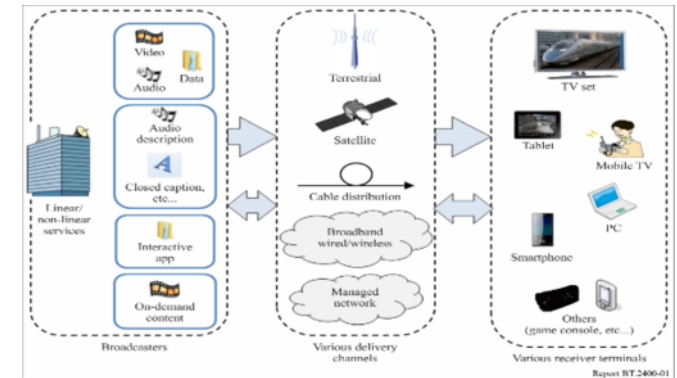




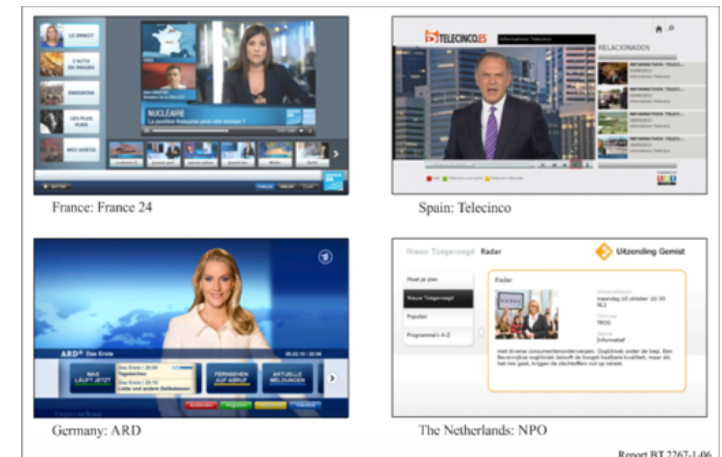
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# ITU-R studies on Broadcasting

- Advanced network planning and transmission methods for enhanced digital terrestrial TV broadcasting
- Internet Protocol (IP) interfaces for transport broadcast programmes and AIAV (Advanced Immersive Audio-Visual) contents
- Application of Interoperable Master Format (IMF) for supply of non-live content to the Global Platform
- Harmonization of applications in Integrated Broadcasting and Broadband (IBB) systems
- Application of AI for all aspects of broadcasting chain



Conceptual block diagram of global platform



Examples of applications in regular operation of IBB system



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# ITU G.fast



**New Supplement on  
G.fast certification**



**BREAKING NEWS: G.fast achieves 2 Gb/s over copper and MG.fast aiming for 5-10Gb/s**



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# 80%

of all Internet traffic  
will be video by 2020



**x2 Primetime Emmy Awards**  
H.264 AVC | H.265 HEVC



**Beyond HEVC:**  
**Strong progress in *Versatile Video Coding* project**

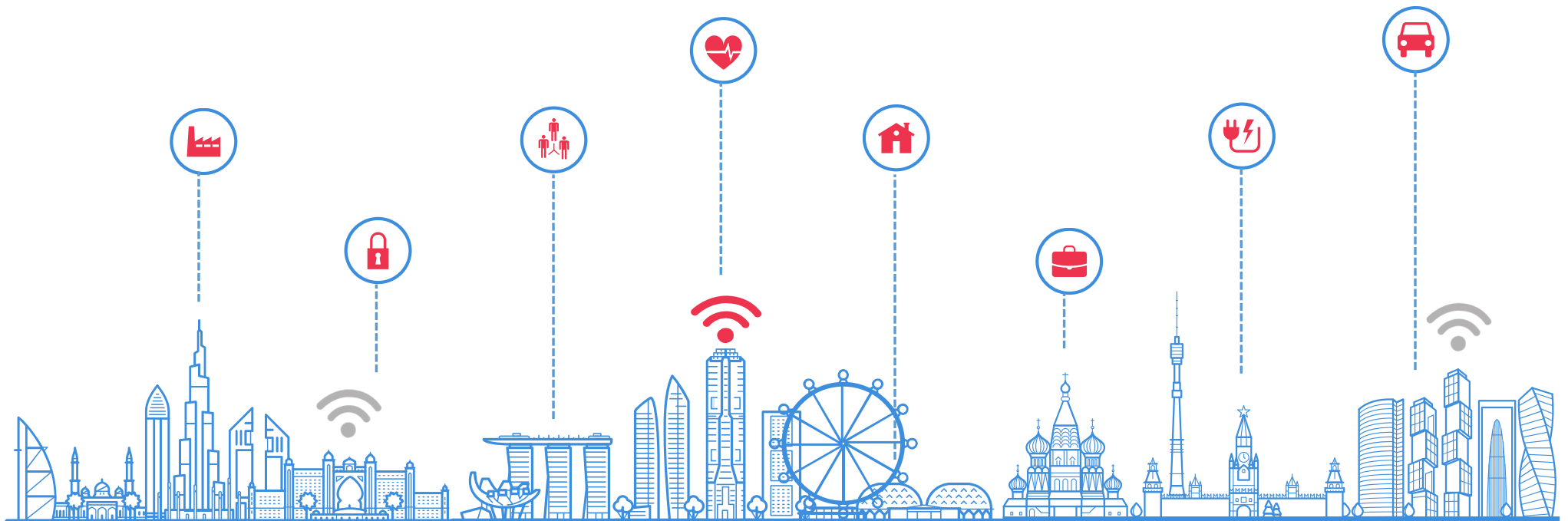


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# IoT, Smart Cities & Green ICTs



- i** Accelerating standardization of **IoT test specifications**, supported by collaboration with oneM2M
- i** Establishing **Smart City KPIs** and setting **environmental requirements of IMT2020/5G**  
- ITU case studies on **Dubai, Singapore** and **Moscow (New!)**





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# Multimedia & health



**New ITU standard on the safe listening of music players in support of the WHO 'Make Listening Safe' initiative**

**New and updated conformance test specs for ITU H.810 Continua Design Guidelines**







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# Performance, QoS & QoE



## New ITU standards address the quality of

- Video gaming
- Videotelephony
- Comms involving vehicles
- Adaptive bitrate video streaming
- ICT services at major sporting and entertainment events



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# Economic and policy issues



## **New ITU standards under approval**

- Relationship between OTTs and network operators
- Competition in mobile financial services
- Principles for a unified format of price/tariffs/rates-lists used for exchanging telephone traffic



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# Protocols and test specs



## **New ITU standards for VoLTE interconnection**

- Interconnection of VoLTE/ViLTE-based networks
- VoLTE/ViLTE interconnection testing for interworking and roaming scenarios

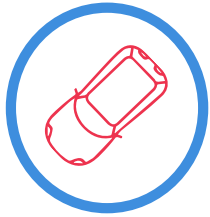
## **Combating ICT counterfeiting and theft**

- New ITU standard: Framework for solution to combat counterfeit ICT devices
- Renewed emphasis on combating tampering with or cloning of ICT device identifiers



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# Security



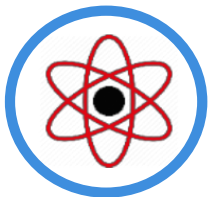
## **New ITU work streams established**

- Security aspects of intelligent transport systems
- Security aspects of distributed ledger technologies



## **Examples of New ITU security standards:**

- Personal data protection
- Secure software updates to connected cars
- Strong authentication for digital financial services

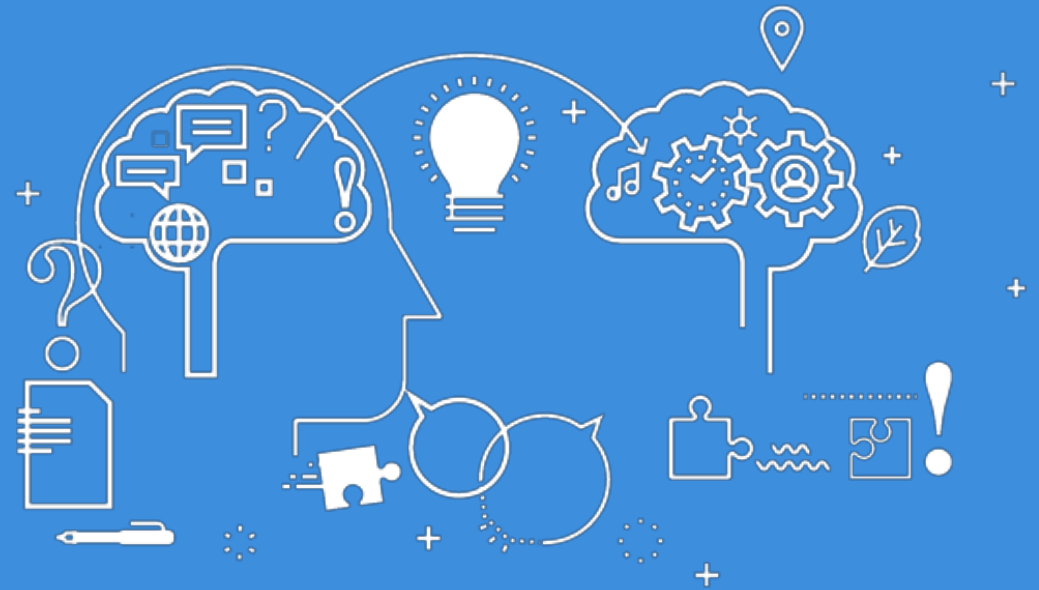


## **Accelerating ITU work on quantum-safe cryptography**



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# Focus Groups addressing fields of growing strategic relevance to ITU members



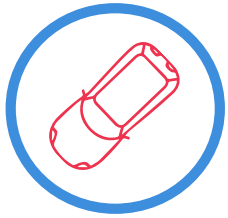




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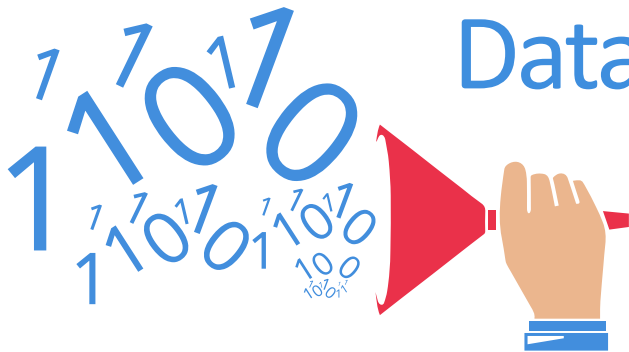


Blockchain



Vehicular multimedia

Digital finance

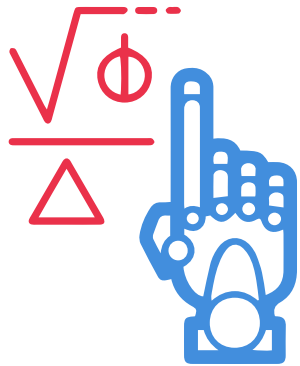


Data processing and management



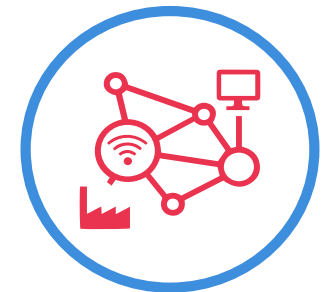
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# Artificial Intelligence for Health



# Machine Learning for 5G

# Network 2030 beyond 5G





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# Supporting slides

## Core membership and new communities joining ITU





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# Some core members shaping ITU standards





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# ITU-T welcomed 45 new members in 2018



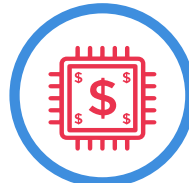
Insurance



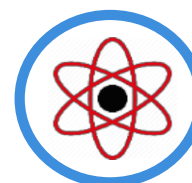
Space



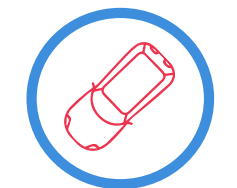
Fintech



Quantum



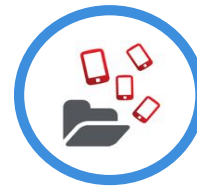
OTTs



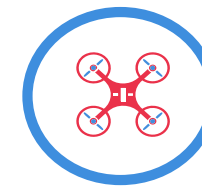
Automotive



IoT



MVNOs/  
MVNEs

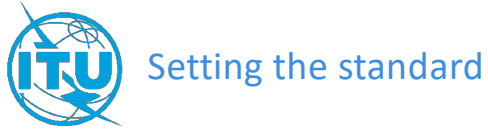


UAVs



Utilities







# Supporting slides: New services and tools





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## Try out MyWorkspace

- ① New personalized webpage for TIES users: Easy access to information and services valued by ITU-T delegates
- ① Version 2 of MyWorkspace includes:
  - ITU-T community and Chat service
  - Meeting documents with a section to retrieve bookmarked documents
  - Mailing list subscriptions
  - Calendar of current and future events
  - Personalized profile and preferences, and much more...
- ① <https://itu.int/net4/itu-t/myworkspace>





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## New services and tools

- ① ICT standards landscape: Overview of standards in any given domain
- ① ITUSearch 2.0: Full collections ITU docs, publications and webpages
- ① TSBCloud: User-friendly, mobile-optimized storage system offering a secure open-source file sharing solution (open from early 2019)
- ① Machine translation engine based on neural networks: To be incorporated in MyWorkspace early 2019





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# Bridging the Standardization Gap

The BSG programme assists developing countries in improving their capacity to participate in the development and implementation of international ICT standards.

-  BSG hands-on training sessions for effective participation in ITU-T work
-  Regional Groups assist ITU-T in addressing the needs of all regions
-  Guidelines for the establishment of National Standardization Secretariats
-  + Fellowships; Study Group mentoring programme; e-learning courses...





# Supporting slides: A closer look at ITU Focus Groups





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# Vehicular multimedia



- i Focus Group identifying use cases and requirements of vehicular multimedia enabled by converged networks
- i Aiming to propose a standardization roadmap for vehicular multimedia





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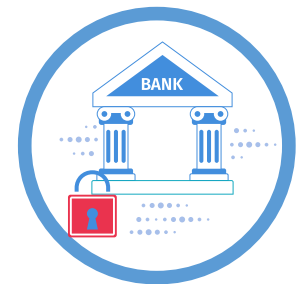
# Digital Financial Inclusion



- ① Financial Inclusion Global Initiative (FIGI) - led by ITU, World Bank, and CPMI, with support from Bill & Melinda Gates Foundation



- ① Focus Group investigating Central Bank issued Digital Currency

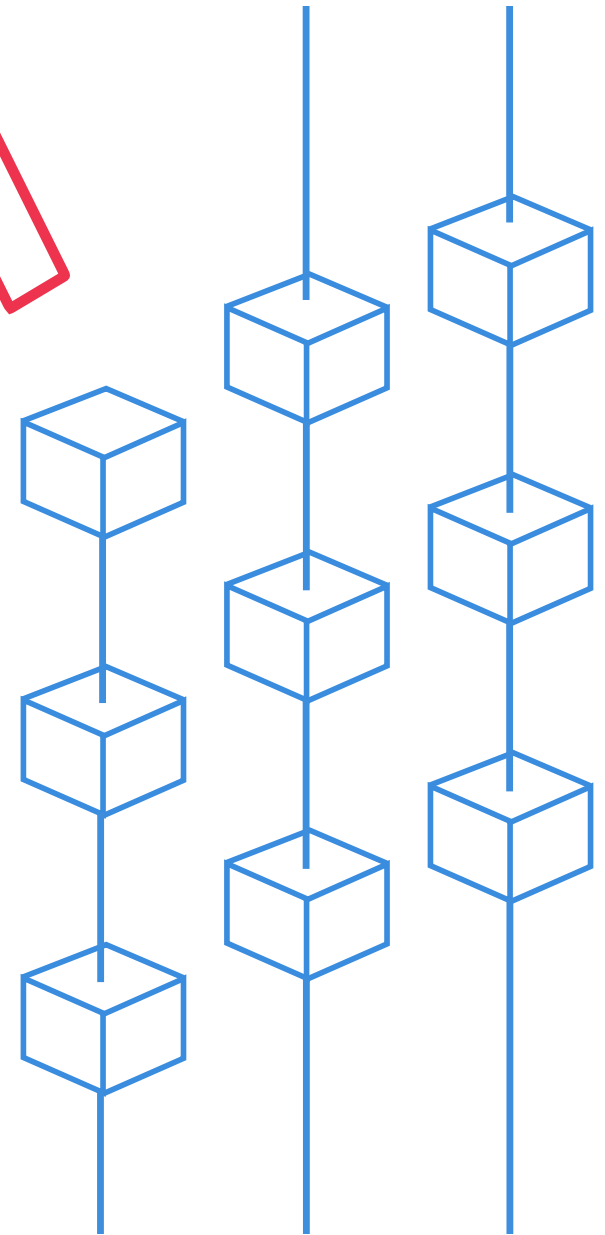
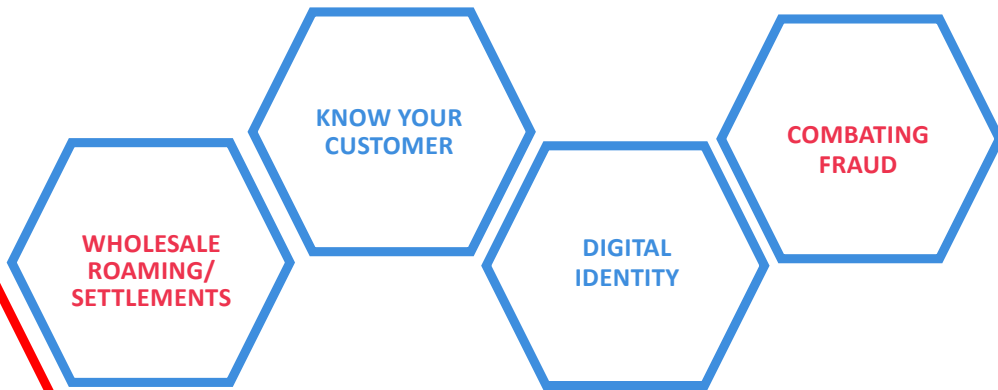






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# Blockchain

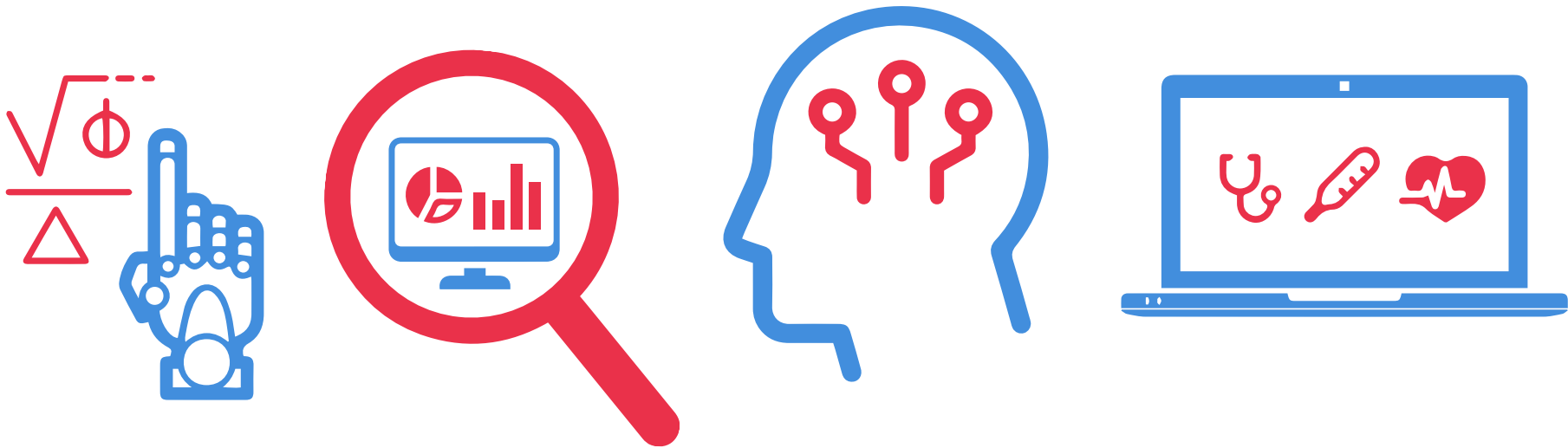


- i Focus Group developing **'assessment framework'** to understand the strengths and weaknesses of **Blockchain** platforms in different use cases
  - Assessment framework to guide potential adopters of **Distributed Ledger Technologies**



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# Artificial Intelligence



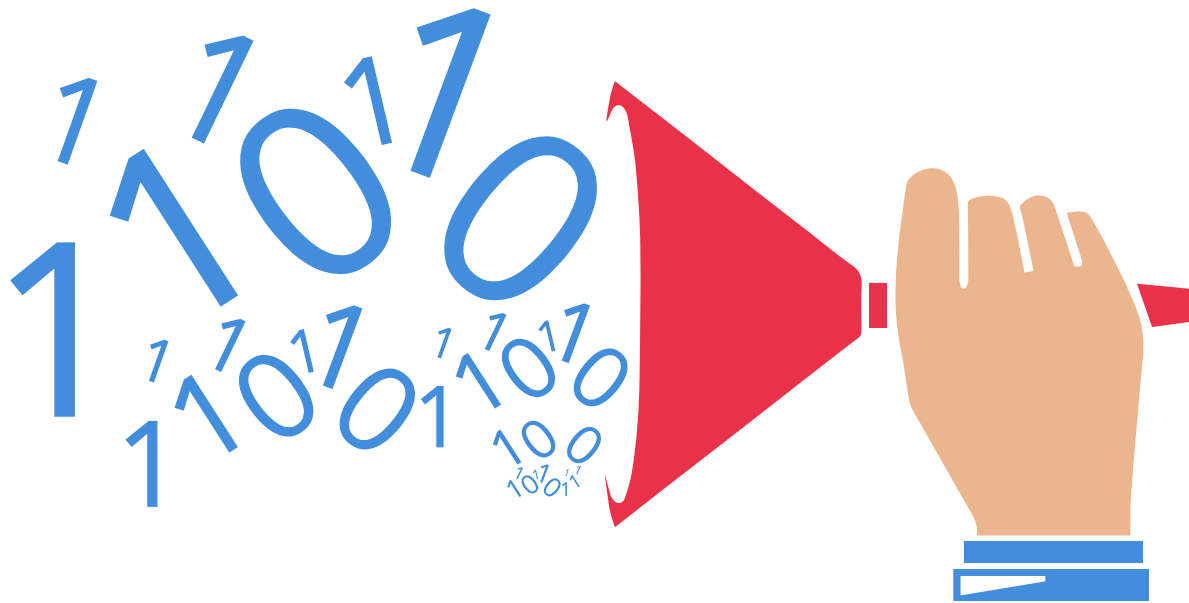
- i Focus Group (ITU & WHO) to deliver framework for the performance benchmarking of 'AI for Health' algorithms
- i Focus Group developing specifications for Machine Learning to support **IMT-2020/5G** systems



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# Data processing and management

- ① Data management, interoperability and security for IoT and Smart Cities





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# Network 2030 beyond 5G

- i Novel scenarios such as hologram communications
- i Extremely high throughput and low latency
- i High-precision communications for tactile & haptic applications





**ITUPP**

**DUBAI 2018**

29 October - 16 November  
Dubai, United Arab Emirates

*Connecting the world, together.*



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## PP-18 and ITU



- New Resolution COM5/3 “Encouraging the participation of small and medium enterprises in the work of the Union”: the participation of SMEs (up to 250 employees) in the Sectors (Associates)
- Revised Resolution 169 “Admission of academia to participate in the work of the Union” allows Academia to participate in TSAG and act as Rapporteur, or as Associate Rapporteur
- New Resolution WGPL/1 “Use of information and communication technologies to bridge the financial inclusion gap: ITU and **ITU-T study groups to study financial inclusion** for developing countries”
- New Resolution COM6/3 “Measures to improve, promote and strengthen ITU fellowships”: emphasizes the importance of criteria such as gender, inclusiveness and geographical distribution



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# PP-18 and ITU



- Revised Resolution 197 “Facilitating the IoTs and SSC”: includes in scope SSC and the SDGs
- New Resolution WGPL/3 “OTTs”: awareness, capacity building, and to **continue the studies on OTT**
- Revised Resolution 177 “C&I”: cooperate with other organizations on C&I testing
- New Resolution COM5/1 “**ITU Journal: ICT Discoveries**” supports the ITU Journal, under the **leadership of the TSBDiR**
- **WTSA-20 in last quarter of 2020**
- Several Resolutions (30, 34, 123, 135, 137, 139, 201, 203) were amended which address bridging the digital divide / capacity building / standardization gap / financial inclusion gap / fellowships



*Connecting the world, together.*