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**Accessible Americas II:**  
**Information and Communication for ALL**

**Standardization and accessibility  
to ICTs in ITU**

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# Contents

- Introduction to ITU
- Importance of standardization
- ICTs and rights of persons with disabilities
- Accessibility standards and ITU

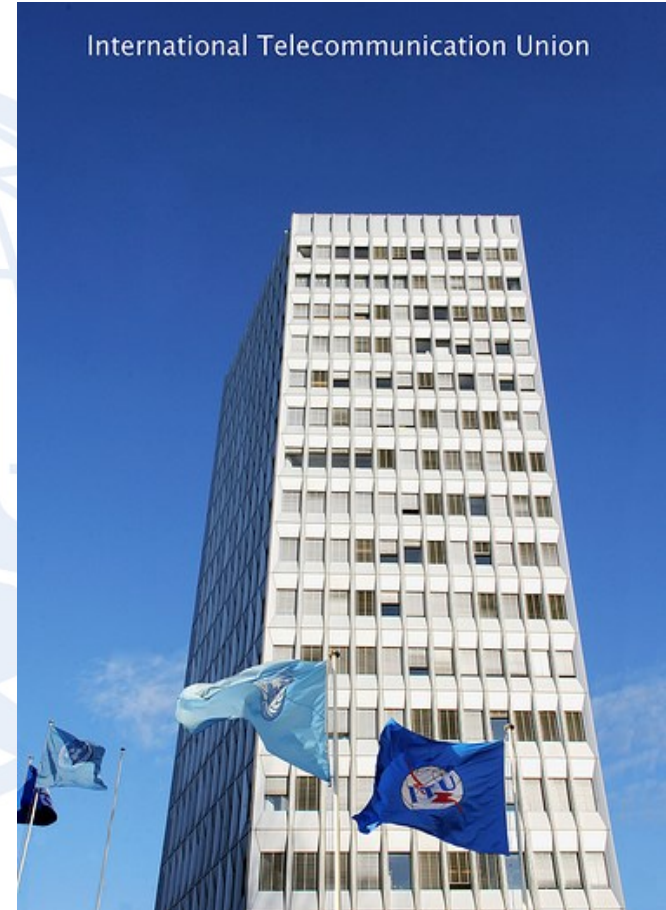
## Extra slides

- UN CRPD
- Examples of ITU standards helping persons with disabilities

# About ITU

- ✓ The **United Nations Specialized Agency** for Information and Communication Technologies (ICTs)
- ✓ Founded in Paris in 1865 as the **International Telegraph Union**
- ✓ 2015 marks **150 years of experience** and innovation

Video: <http://youtu.be/JFI9EvPQdCw>



# ITU's Global Presence



# A sample of ITU's private sector members





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# ITU's Structure

## Radiocommunication ITU-R

Coordinates global wireless communication

## Standardization ITU-T

Produces interoperable technical ICT standards



## Development ITU-D

Provides assistance to the un-connected

The **General Secretariat** provides intersectoral coordination for the whole organization

# ITU-R: Radiocommunication Sector

Manages the radio-frequency spectrum and satellite orbits.



## UNITED STATES FREQUENCY ALLOCATIONS THE RADIO SPECTRUM

### RADIO SERVICES COLOR LEGEND

ADMINISTRATIVE SERVICE	FIXED SATELLITE	RADIO AERONAUTICS
ADMINISTRATIVE SERVICE	LAND MOBILE	RADIO TELEVISION
ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION
ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION
ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION
ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION
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ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION
ADMINISTRATIVE SERVICE	LAND MOBILE	NAVIGATION

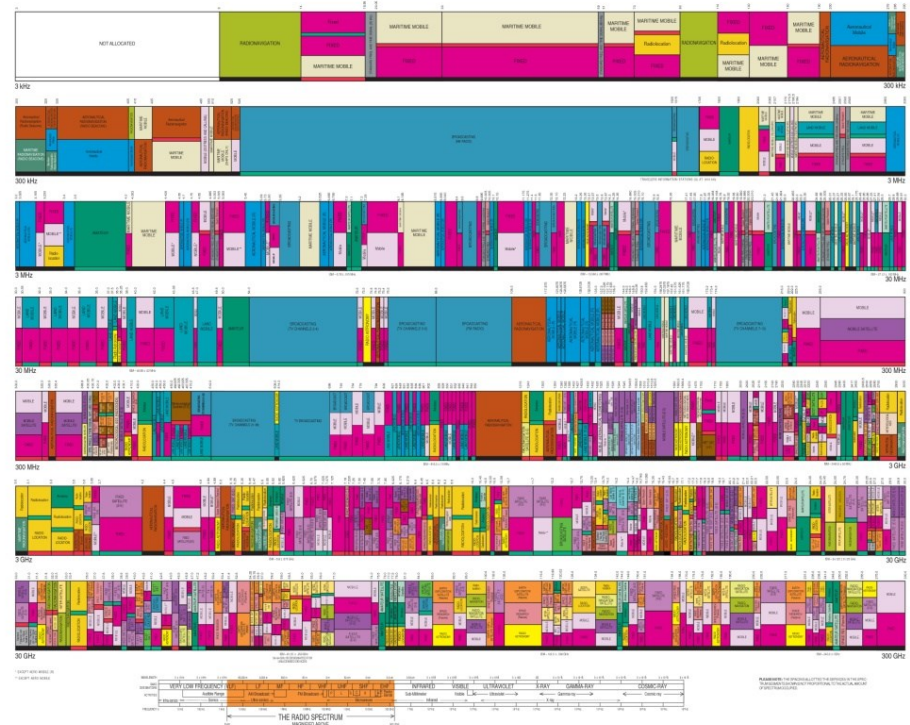
### ACTIVITY CODE

GOVERNMENT EXCLUSIVE	GOVERNMENT NON-EXCLUSIVE
GOVERNMENT EXCLUSIVE	GOVERNMENT NON-EXCLUSIVE

### ALLOCATION USAGE DESIGNATION

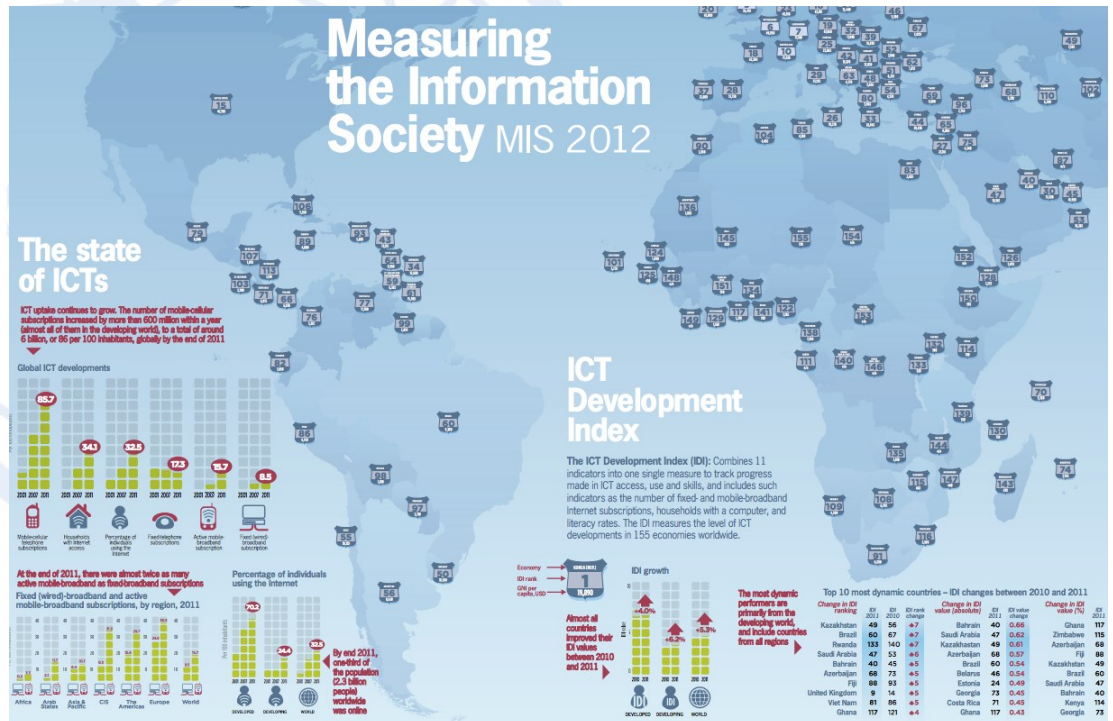
NAME	EXAMPLE	DESCRIPTION
Primary	Primary	Primary
Secondary	Secondary	Secondary

U.S. DEPARTMENT OF COMMERCE  
National Telecommunications and Information Administration  
Office of Spectrum Management  
October 2013



# ITU-D: Development Sector

Fostering international cooperation and solidarity in the delivery of technical assistance and in the creation, development and improvement of telecommunication/ICT equipment and networks in developing countries.

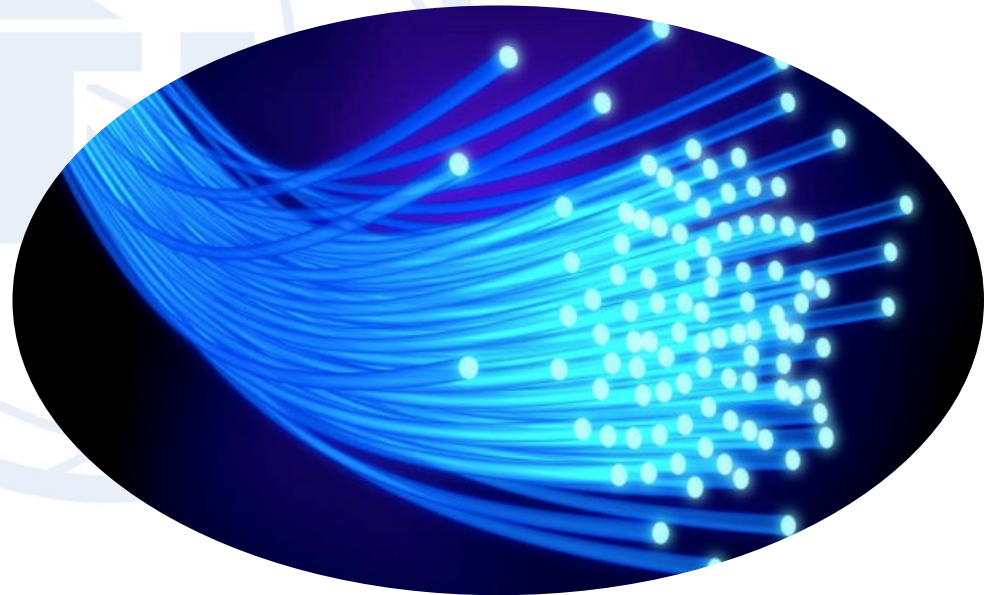




# ITU-T: Standardization Sector

Provides a **neutral platform** where governments *and* the private sector develop international standards covering all fields of telecommunications.

Defines tariff and accounting principles for international telecommunication services.



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# Importance of standardization

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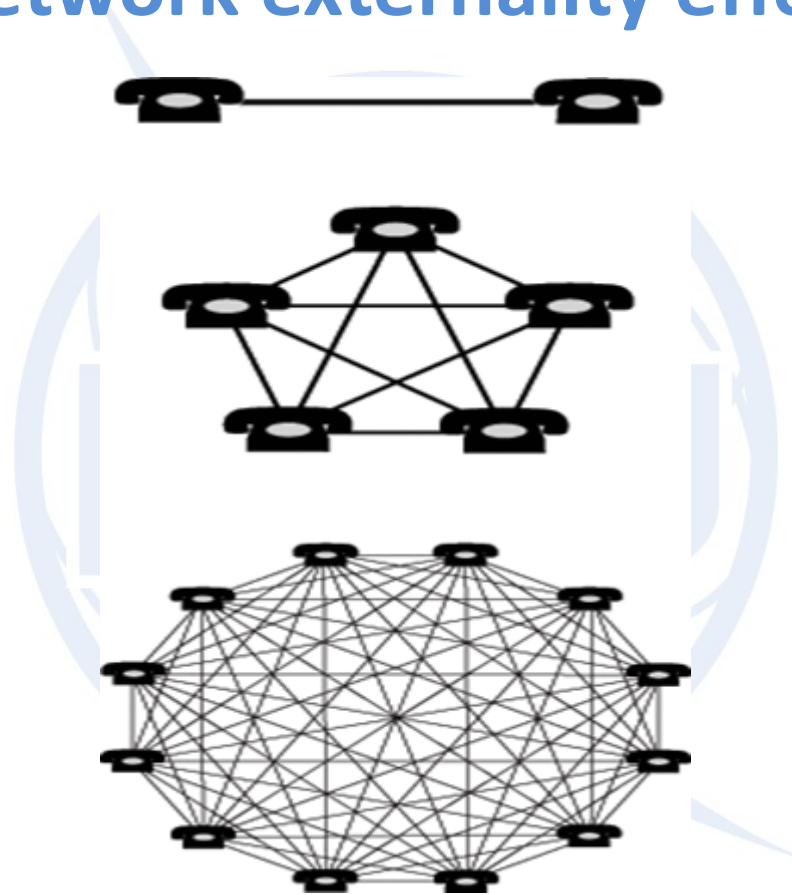
# Impact of standards

BSI study on *The Economic Contribution of Standards to the UK Economy* (June 2015)

- Use of standards improves client-supplier relationship through improved confidence
- Most productive companies are those heavily deploying standards
- Standards encouraged innovation through the diffusion of new knowledge
- Standards facilitate compliance with regulations (e.g. health and safety legislation)

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# Open standards promote a "network externality effect"



Technical compatibility (Interoperability) fostering a growing number of users

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# ICTs and rights of persons with disabilities

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# Accessibility and disability – some facts

- Worldwide, some 1 billion persons with a disability (=15%)
- 80% of persons with disabilities live in low income countries
- Amongst people *below* the poverty level, 1 out of 5 is a PoW
- UN Convention on the Rights of Persons with Disabilities (UNCRPD) mandates signatories to provide public information in formats appropriate to different kinds of disabilities
- ICTs are a powerful equalizer of abilities, empowering persons with disabilities to fulfill their potential, dreams and ambitions

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# UN Convention on the Rights of Persons with Disabilities

- Signed: Dec. 2006; In-force: May 2008
  - Two impressive aspects
    - Strong language
    - High level of adoption by countries
  - Seven articles mentioning ICTs
    - Most relevant from an ICT standards perspective: Article 9
- 
- |                     |                      |
|---------------------|----------------------|
| ■ Convention*       | ■ Optional protocol* |
| ➤ 160 signatories   | ➤ 92 signatories     |
| ➤ 159 ratifications | ➤ 88 ratifications   |

\* as of 2015-10-29

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# Definitions

- **PERSONS WITH DISABILITIES**

Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments, which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.

- **UNIVERSAL DESIGN**

Design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

“Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.



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# UNCRPD Article 9 – Accessibility

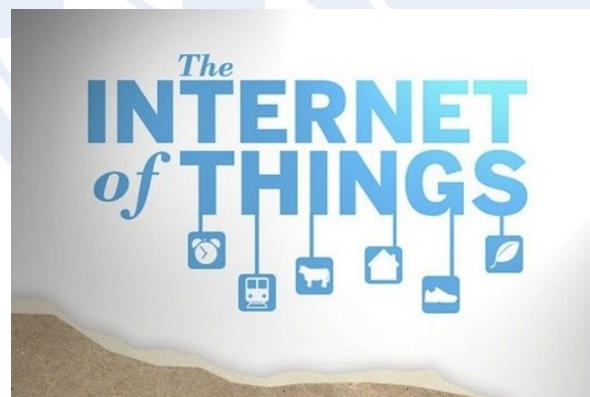
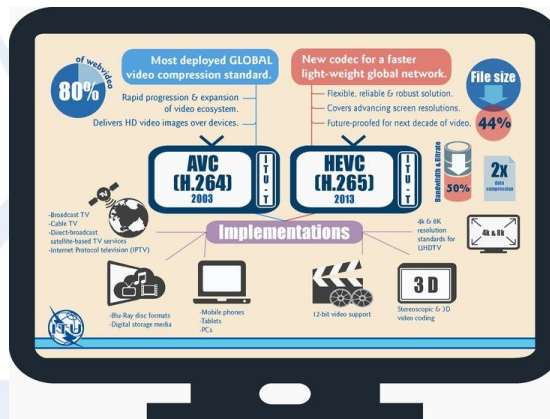
- Identify and eliminate **obstacles and barriers** to accessibility, including information, communications and other services, such as electronic services and emergency services
  - Independent life and full participation in all aspects of life
- Develop, promulgate and monitor the implementation of **minimum standards and guidelines** for the accessibility of facilities and services open to the public
- Ensure that private entities offering services to the public **take into account** all aspects of accessibility
- Provide **training** for stakeholders on accessibility issues
- **Promote** appropriate forms of **assistance and support** to persons with disabilities to ensure their access to information
- **Promote access** to new information and communications technologies and systems, including the Internet
- Promote **universal design**: the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so they are accessible at minimum cost

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# Accessibility standardization in ITU

# A sample of ITU standardization areas



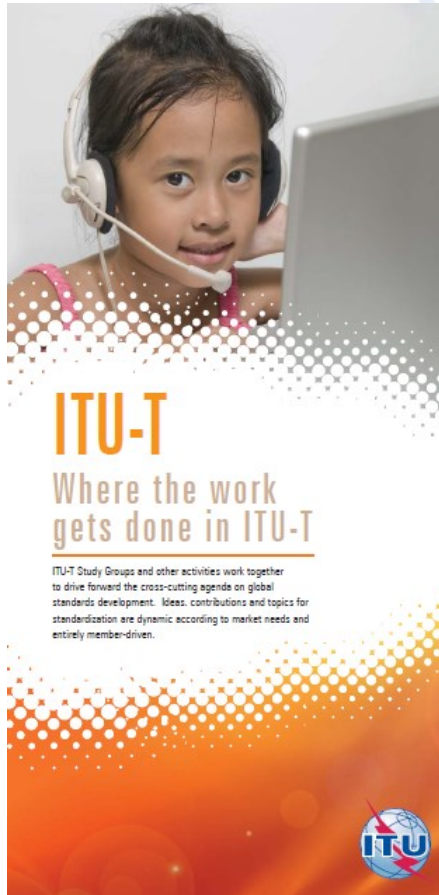
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# Why accessibility?

- Large number of persons affected
  - Disabilities touch 15% of world population; 80% live in low income countries
- Increasing number of countries ratifying UN Convention on Rights of Persons with Disabilities
  - Consequences in legislation & regulation
- It goes beyond persons with disabilities
  - Children, functional illiterate, elderly, ...
- Mainstreaming is important:
  - Human rights
  - Societal efficiency
  - Drives down cost, increases user base
- An unanswered question:  
How to provide accessible ICT services in a cost effective manner?
  - Standards!
  - Universal design



# ITU-T Study Groups



- SG2 Operational aspects
- SG3 Economic and policy issues
- SG5 Environment and climate change
- SG9 Broadband cable and TV
- SG11 Protocols and test specifications
- SG12 Performance, QoS and QoE
- SG13 Future networks
- SG15 Transport, access and home
- SG16 Multimedia
- SG17 Security
- SG20 IoT and Smart Cities (2015-06)

# Long history – a small sample



- Mid 1990's – ITU-T V.18 text telephone
- ITU-T E.161 (1995) – the tactile identifier
- ITU-T F.703 (2000) introduces the concept "Total Communication"
- ITU-T T.140 (1998) real-time text for multimedia applications

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# ITU-T groups promoting accessible ICT's

- Expert Groups
  - Study Group 16 - Multimedia - Lead SG  
ITU study group on telecommunication/ICT accessibility for persons with disabilities -  
Question 26/16 and work items
  - Study Group 2 on Operational aspects - Question 4/2 focused on human factors and related work items

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## Study Group 16

- *Multimedia coding, systems and applications*
  - The lead study group on telecommunication/ICT accessibility for persons with disabilities





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## Question 26/16

- Q26/16 is the group mandated to study accessibility to multimedia systems and services for persons with disabilities
- Develops (or assists in the development of) multimedia technical standards addressing accessibility needs of persons with disabilities
- It also reviews accessibility features included in telecom standards developed in other Study Groups

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# Recently completed work (1)

- Accessible IPTV terminal devices:
  - Recommendation **ITU-T H.702** (ex H.IPTV-AccProf)
    - Input from the community of persons with disabilities,
  - Three profiles for accessibility features in IPTV terminals:
    - Basic → Enhanced → **Main**
    - Basic profile: entry level of accessibility features
    - Main level: support by 2020 in all IPTV sets and set-top boxes
- Terminology for ICT accessibility
  - Recommendation **ITU-T F.791** (ex F.ACC-TERM)
  - Fixes basic and preferred terminology for international use

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## Recently completed work (2)

- A pair of complementary technical papers
  - **ITU-T FSTP-AM:**
    - How to organize accessible meetings
  - **ITU-T FSTP-ACC-REMPART**
    - Ensuring that remote participation in meetings is accessible for persons with disabilities
    - Complements the new ITU-T A-Series Supplement 4 on the organization of remote participation in meetings.

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# Examples of active work items

- SG16 is developing specifications in many areas:
- Relay services: Architecture, user requirements and functionality
- Emergency communications: Interface specification allowing persons with hearing and speaking difficulties to request rescue services
- Accessibility features and use cases for mobile media devices
- Use cases for inclusive media access services
- Specifications for improving the intelligibility of audio
- Guidelines for provision of captioning and sign language in audiovisual content

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# ITU-T Study Group 2



- SG2 organizes its accessibility work under [Question 4/2](#)
  - “Human Factors related issues for the improvement of the quality of life through international telecommunications”
- Usability for all covers the needs of children and persons who may or may not have disability
- Human factors cover more than just the needs of persons with disabilities



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# Examples of active work items

- Human factor specifications are being developed in several areas, for example:
  - Standard audio signal for language selection
  - User interface for face-to-face speech translation considering human factors
  - On-screen keyboards for ICT devices

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## Other experts groups

- [Intersector Rapporteur Group on Audiovisual Media Accessibility \(IRG-AVA\)](#)  
(launched 25 February 2014)NEW!
- [Joint Coordination Activity on Accessibility and Human Factors \(JCA-AHF\)](#)  
(under TSAG since 2015-06)
- [Dynamic Coalition on Accessibility and Disability \(DCAD\) at the Internet Governance Forum \(IGF\)](#)
- [ITU-T Focus Group on Audiovisual Media Accessibility \(FG AVA\)](#)  
(concluded Oct. 2013; work transferred to ITU-T SG16)

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# Intersector Rapporteur Group on Audiovisual Media Accessibility (IRG-AVA)

- Harmonized development of standards for audiovisual media accessibility across ITU-T and ITU-R
  - Survey of possible work items
- ITU-R and ITU-T working together on making audiovisual media accessible
  - ITU-R Study Groups 6 (Broadcasting service)
  - ITU-T SG16 (Multimedia)
  - ITU-T SG9 (Broadband cable and TV)
- Home page: <http://itu.int/en/irg/ava>

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# How to contribute?

- Work progresses on the basis of technical proposals (= "contributions") received
- Provide experts to attend meetings and to submit contributions at ITU study group meetings
  - Members submit written technical proposals to create recommendations and standards
  - No contributions, no international standards;  
no proposals = no progress
- Participate in the ITU-T JCA-AHF, the group responsible for coordinating the accessibility work

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**Some other ways**



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# Sharing knowledge at ITU workshops

- Workshops review existing and next-generation accessibility technology, services and assistive technologies (AT) for persons with disabilities
- Open forums to discuss use cases for accessibility implementation
- Explore the benefits of Universal Design to prevent expensive after-market retrofitting for the inclusion of persons with disabilities
  - Include accessibility features in standards from the beginning
- Expert sharing of knowledge and good practices to further work on including persons with disabilities into the standardization of multimedia, as mandated by the Convention on the Rights of Persons with Disabilities (article 9 of the UNCRPD)
- Workshops provide a showcase for accessibility services and devices currently on the market and under development by the private sector and research institutes
- Example:
  - [ITU Workshop on Making Media Accessible to all: the options and the economics](#) (October 2013)



# ITU and IPC IPTV Application Challenge

Better quality of life with international standards:  
an accessible world for all

- Raising awareness of the importance of multimedia and multimodal audio-visual accessibility for everyone, especially persons with a variety of levels and types of disabilities.
- Promoting innovative accessibility ideas to be further developed for actual deployment in systems built to ITU-T's IPTV specifications.
- Awarding ceremony and showcase at **Rio Paralympics Games 2016**
- A first prize of **USD 5,000** for individuals and small-to-medium enterprises (profit or non-profit)
- Selected participants will have an opportunity to receive technical support to develop ITU-T IPTV application
- **Call for Concept Papers** at: <http://itu.int/challenges/iptv>
- **Deadline:** Submission **30 January 2016**

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# Don't only preach...

- ITU takes implementation of the UNCRPD at heart
  - Not just standards, case studies, kits, ...
- Plenipotentiary Conference Res.175
  - "Telecommunication/information and communication technology accessibility for persons with disabilities, including age related disabilities"
- ITU [Accessibility Policy](#): remove accessibility barriers in all ITU services
- Efforts to make website and publications accessible
- Providing accessibility accommodation at meetings
  - Sign language interpretation
  - Real-time captioning
- Encourage participation of persons with disabilities
  - ITU Accessibility Fund with contributions from donors
- Lead the use of ICTs for accessible meetings in the UN system

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# Conclusion

- ITU has been a pioneer in ICT standards for accessibility
- International standards are necessary for affordable, inclusive, accessible services
- Useful specifications being produced
  - Next priority: Telecoms relay services
- ITU has embraced accessibility also at an institutional level

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**We are connecting the world by working on  
making technology accessible to all and by  
including persons with disabilities.**

**Help us in this valuable work by  
joining us at the ITU.**

**Thank you!**



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# Extra slides

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# Mandates on ICTs for persons with disabilities

- WSIS Phase 1 (2003) – Declaration of Principles & Plan of Action
- WSIS Phase 2 (2005) – Tunis Agenda & Commitment
- UN Convention on the Rights of Persons with Disabilities (UNGA-06)
- WTSA-12 Resolution 70 – Telecommunication/ICT accessibility for persons with disabilities
- WTDC-14 Resolution 56 (Dubai) – Telecommunication/ICT accessibility for persons with disabilities, including persons with age-related disabilities
- PP-14 Resolution 175 – Telecommunication/ICT accessibility for persons with disabilities and persons with specific needs

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# Highlights on the UN Convention on the rights of persons with disabilities



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# Contents

- Background
- Principles of the Convention
- Articles with accessible ICT implications
- Current status

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# Antecedents

- UN World Programme of Action (WPA) concerning Disabled Persons, December 1982
  - Guiding instrument for the UN Decade of Disabled Persons (1982-1993)
  - First international instrument to attempt to articulate both a developmental and a rights-based approach to disability
  - Established the foundation for international monitoring
  - One of its major outcomes: Standard Rules
- Standard Rules on the Equalization of Opportunities for Persons with Disabilities, December 1993
  - Instrument for policy-making as well as a basis for technical and economic cooperation
  - A set of 22 rules addressing all aspects of life of persons with disabilities
  - Provide for a continuum of interventions that are critical to the equalization of opportunities for all persons with disabilities
  - Significant contribution to the advancement of legislation and regulations around the world and the establishing the Convention



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# Definitions

- **Persons with disabilities**

Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments, which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.

- **Universal design**

Design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

“Universal design” shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.

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# Principles of the Convention

1. Respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons
2. Non-discrimination
3. Full and effective participation and inclusion in society
4. Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity
5. Equality of opportunity
6. Accessibility
7. Equality between men and women
8. Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities

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# Main features

- Main obligations to States Parties
  - Remove any discriminatory legislations, policies, practices, etc.
  - Enact new legislations, policies, practices to promote an independent life and full participation in society of persons with disabilities
- Main part plus optional protocol
  - Assessment by the Committee on the Rights of Persons with Disabilities of claims of violation of the Convention
- Framework to help States Parties to plan next steps towards meeting the convention goals

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## Articles mentioning ICTs

- Article 9 – Accessibility
- Article 21 – Freedom of expression and access to information
- Article 29 – Participation in political and public life
- Article 30 – Participation in cultural life, recreation, leisure and sport
- Article 31 – Statistics and data collection
- Article 32 – International cooperation
  
- Article 22 – Respect for privacy

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# Article 9 – Accessibility

- Identify and eliminate obstacles and barriers to accessibility, including information, communications and other services, such as electronic services and emergency services
  - Independent life and full participation in all aspects of life
- Develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open to the public
- Ensure that private entities offering services to the public take into account all aspects of accessibility
- Provide training for stakeholders on accessibility issues
- Promote appropriate forms of assistance and support to persons with disabilities to ensure their access to information
- Promote access to new information and communications technologies and systems, including the Internet
- Promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so they are accessible at minimum cost.

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# Article 21 – Freedom of Expression and Access to Information

- States Parties to ensure that persons with disabilities can seek, receive and share information and ideas on an equal basis with others and through all forms of communication of their choice, including accessible ICT
- Timely and affordable availability of content in accessible formats and using technologies appropriate to different kinds of disabilities
- In official interactions, accept and facilitate the use of sign language, Braille, augmentative and alternative communication, and all accessible means, modes and formats of communication of their choice by persons with disabilities
- Urge private entities to provide information and services in accessible and usable formats, including services to the general public through the Internet
- Encourage mass media, including providers of information through the Internet, to make their services accessible to persons with disabilities



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## Article 29 – Participation in political and public life

- Guarantee to persons with disabilities political rights and the opportunity to enjoy them on an equal basis with others.
- Facilitate the use of assistive and new technologies where appropriate when protecting the right to vote by secret ballot, and the right to stand for elections, to hold office and to perform all public functions at all levels of government.

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# Article 31 – Statistics and data collection

- Collect appropriate information, including statistical and research data to enable them to formulate and implement policies to carry out the Convention.
- Information must be disaggregated, as appropriate, and used to assess the implementation of obligations under the Convention and to identify barriers faced by persons with disabilities
- Make statistics accessible to persons with disabilities
- Used for reporting progress in States Parties on the implementation of the Convention (CRPwD)

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# Other Articles

## **Article 22 – Respect for privacy**

- Issues of data protection in ICTs (e.g. cybersecurity)

## **Article 30- Participation in cultural life, recreation, leisure and sport**

- Take measures to ensure that cultural materials, television programmes, films, theatre and other cultural activities are available in accessible formats

## **Article 32- International Cooperation**

- Facilitate cooperation in research and access to scientific and technical knowledge
- Provide technical and economic assistance, including the facilitation of technology transfer and of access to and sharing of accessible and assistive technologies

## Current status\*

- Convention

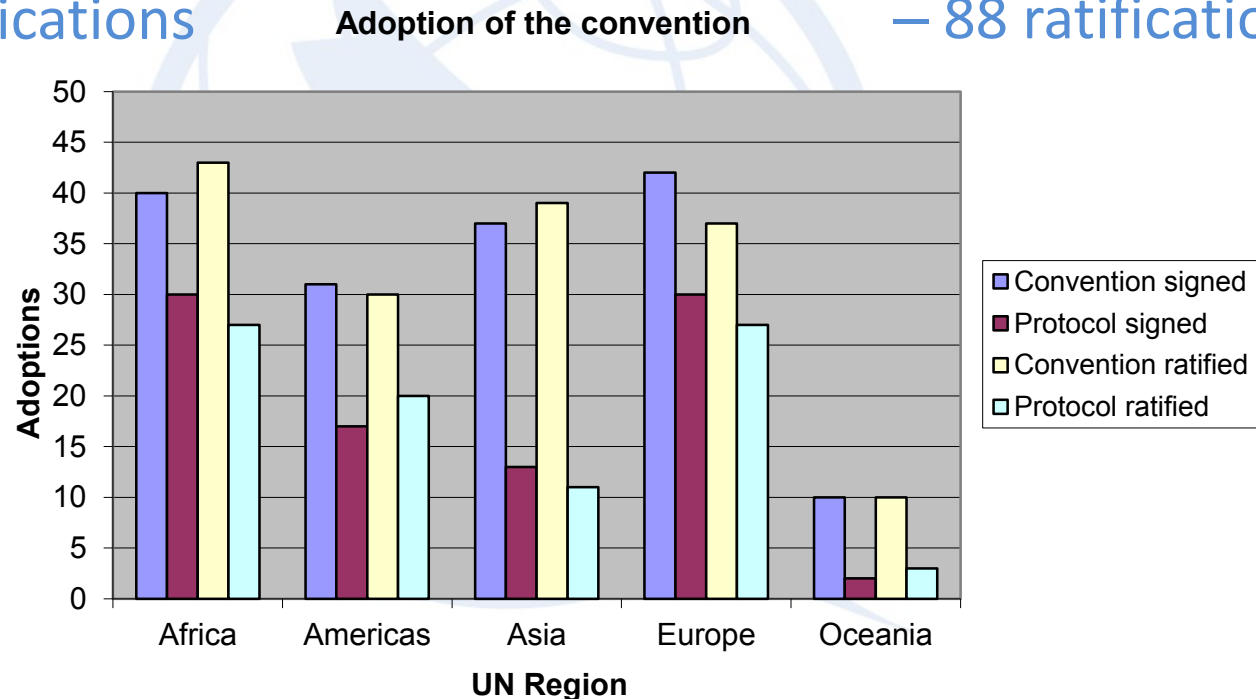
- 160 signatories

- 159 ratifications

- Optional protocol

- 92signatories

- 88 ratifications



\* *Signing* does not commit states; *Ratification* does

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# Web resources

- UN Convention – UN Enable initiative  
→ [www.un.org/esa/socdev/enable](http://www.un.org/esa/socdev/enable)
- G3ict - the Global Initiative for Inclusive ICTs  
→ [www.g3ict.com](http://www.g3ict.com)
- Testing the accessibility of a web page  
→ [www.cynthiasays.com](http://www.cynthiasays.com)

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# **Examples of ITU standards in use in the world today by persons with disabilities**



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# ITU-T V.18: ITU's first accessibility standard for deaf telecommunications



- Approved in 1995 and unified five different types of text telephones so that they would work back to back
- Text Telephones:
  - Convert typed characters into tones that are sent through the telephone lines so that deaf people can read them in real time
  - Used with a "relay" service enabling deaf people to communicate with hearing people (an operator reads what a deaf person types and types back to the deaf person what a hearing person says)

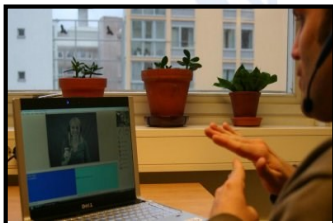
# ITU-T E.161: The Tactile Identifier



- To help people who are blind & visually impaired to use the telephone keypad
  - The “Bump” on key “5” is the tactile identifier

# ITU-T F.703: Total Conversation

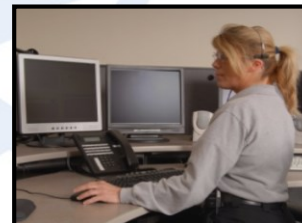
- Puts user in the **center** of the communication society
- Is an audiovisual conversation service providing real-time transfer of video, text and voice between users



Users with Total  
Conversation  
Real-time text  
devices



Text, sign  
& captioned  
relay services



Emergency Service  
Outreach 112 ,  
911,...

# How a deaf-blind person uses multimedia communication?

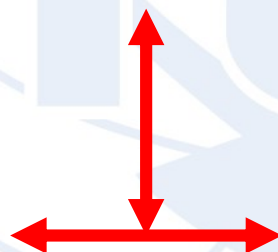
Example: A deaf-blind woman in a Total Conversation call, producing sign-language and receiving text by using assistive technology/Refreshable Braille Display



# Video/Text Relay Services



**Signing User**



**3-party**

**Video/Text relay  
service  
Operator  
translating  
sign language,  
voice, text**



**Talking, Voice and Text**



# ITU-T Y.1901: Making IPTV accessible

- Audio description describing to the blind the visual action on the screen
- Captions enabling people with hearing loss to understand the dialogue
- Supplementary video to display sign language interpretation
- Many other tools such as the ability of the user to record accessibility features



# Sign language and lip-reading via video



- Supplement 1 to the ITU-T H-series of Recs (1999)
  - A usable sign language and lip-reading communication requires a frame rate of at least 25 frames per second



# Real-time captioning (CART)

- Real-time transcript of speakers on screen
- Mandatory for hearing impaired participants
- Useful for persons whose native language is not being spoken
- Captioning service can be provided on site or remotely
- Allows remote participation as captioning can be viewed on an URL on the web



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# Some ITU-T Standards on Accessibility

- ITU-T V.18 for text telephony
- ITU-T T.140 as the general presentation protocol for text conversation
- ITU-T T.134 for text conversation in the ITU-T T.120 data conferencing environment
- Annex G to ITU-T H.323 for text conversation in ITU-T H.323 packet multimedia environment
- Annex L to ITU-T H.324 for text conversation in low bit-rate multimedia applications
- ITU-T F.703 – Multimedia conversation service description. Includes definitions of the accessible conversational services
- H-series Supplement 1 – Application profile – Sign language and lip reading real time conversation using low bit rate video communication
- ITU-T F.790 – Telecommunications accessibility guidelines for older persons and persons with disabilities
- ITU-T Y.1901, Requirements for the support of IPTV services
- Technical Paper ITU-T FSTP-TACL (2006), Telecommunications Accessibility Checklist

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# ITU-T's Accessibility Landmarks

- 1991: ITU is first international standards body to address accessibility issues
- 1994: the international text telephone standard, Recommendation ITU-T V.18, is published
  - A major landmark tying together text telephone protocols allowing different - previously incompatible – text phones in different countries to communicate
- 2008: World Telecommunication Standardization Assembly (WTSA-08): First ITU Resolution 70 to address accessibility
- 2010: World Telecommunication Development Assembly (WTDA-10): Accessibility Resolutions 58 and 70
- 14 October 2010: World Standards Day: “Standards make the world accessible for all”
- October 2010: First Plenipotentiary PP10 Accessibility Resolution 175; Addressing Accessibility for All of ITU

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# For more information

- <http://itu.int/en/ITU-T/accessibility>
- <http://itu.int/en/ITU-T/studygroups/com16/accessibility>
- <http://itu.int/interop>
- <http://itu.int/en/ITU-T/challenges>
- <http://itu.int/ITU-T/go/sg16>
- <http://itu.int/ITU-T/go/sg2>
- <http://itu.int/en/ITU-T/jca/ahf>
- <http://itu.int/en/irg/ava>