

最后报告

ITU-D
第1研究组

第7/1号课题

残疾人和有具体需求 群体的电信/信息通信技术 (ICT) 服务无障碍获取

第6研究期

2014-2017年



联系我们

网站: www.itu.int/ITU-D/study-groups
国际电联电子书店: www.itu.int/pub/D-STG/
电子邮件: devsg@itu.int
电话: +41 22 730 5999

第7/1号课题：残疾人和有具体需求群体的电信/信息通信技术（ICT）服务无障碍获取

最后报告

前言

国际电联电信发展部门（ITU-D） 研究组提供一种文稿驱动工作的中立平台，政府、行业和学术界的专家在此聚集，制定实用的工具和导则并开发资源来解决发展问题。ITU-D成员通过ITU-D研究组的工作，研究和分析以任务为导向的具体电信/ICT课题，从而加快各国发展优先工作的进展。

研究组为所有ITU-D成员提供机会来交流经验、提出想法、交换意见，并就研究处理电信/ICT优先工作的适当战略达成共识。ITU-D研究组负责根据成员提交的输入意见或文稿来制定报告、导则和建议书。国际电联通过调查、文稿和案例研究收集的信息利用内容管理和网络发布工具公开提供，以方便成员的轻松访问。研究组的工作与ITU-D不同计划和举措相关联，以发挥协同作用，使成员在资源和专业知识上受益。与在相关议题领域开展工作的其他群体和组织进行协作至关重要。

ITU-D研究组的研究课题由四年一届的世界电信发展大会（WTDC）决定，每届WTDC为界定下一个四年的电信/ICT发展问题和优先工作制定工作计划和导则。

ITU-D第1研究组的工作范围是研究“**发展电信/ICT的有利环境**”，ITU-D第2研究组则是研究“**ICT应用、网络安全、应急通信和适应气候变化**”。

在2014-2017年研究期，由以下人员指导**ITU-D第1研究组**的工作：主席McElvane Webber（美利坚合众国）和代表六个区域的副主席：Regina Fleur Assoumou-Bessou（科特迪瓦）、Peter Ngwan Mbengie（喀麦隆）、Claymir Carozza Rodriguez（委内瑞拉）、Victor Martinez（巴拉圭）、Wesam Al-Ramadeen（约旦）、Ahmed Abdel Aziz Gad（埃及）、Yasuhiko Kawasumi（日本）、Nguyen Quy Quyen（越南）、Vadym Kaptur（乌克兰）、Almaz Tilenbaev（吉尔吉斯共和国）和Blanca Gonzalez（西班牙）。

最后报告

针对第7/1号课题：“残疾人和有具体需求群体的电信/信息通信技术服务无障碍获取”的最后报告在3位共同报告人Miran Choi（大韩民国）、Abdoulaye Dembele（马里）和Amela Odobasic（波斯尼亚和黑塞哥维那）的领导下制定，参与工作的还有4位副报告人：Lyliane Kalubi（刚果民主共和国）、Mitsuji Matsumoto（日本）、Godfrey Muhatia Mutsotso（肯尼亚）和Joëlle G. Zopani Yassengou（中非共和国）。ITU-D联系人和ITU-D研究组秘书处也协助他们开展工作。

ISBN

978-92-61-22795-1 (Paper version)

978-92-61-22805-7 (Electronic version)

978-92-61-22815-6 (EPUB version)

978-92-61-22825-5 (Mobi version)

本报告由来自不同主管部门和组织的众多志愿人员编写。文中提到的具体公司或产品，并不意味着它们得到了国际电联的认可或推崇。



打印本报告之前，请考虑到环境影响

© ITU 2017

保留所有权利。未经国际电联事先书面许可，不得以任何手段对本出版物的任何部分进行复制。

前言	ii
最后报告	iii
内容提要	vii
i. 引言	vii
ii. 情况说明	vii
1 第1章 – 电信和ICT无障碍获取政策与监管框架	1
1.1 为何要促进残疾人和有特殊需求群体无障碍获取电信和ICT?	1
1.2 残疾人和有特殊需求群体无障碍获取电信和ICT的法律、政策和监管框架	1
1.3 对现有法规进行必要变更，以提高ICT无障碍获取性的导则和建议	2
1.4 当前残疾人和有特殊需求群体无障碍获取电信和ICT的政策和规章概述	3
1.5 优秀做法、面临的问题及可用的案例研究	3
2 第2章 – ICT无障碍获取生态系统中的技术和解决方案	6
2.1 移动通信的无障碍获取政策框架	6
2.1.1 无障碍使用电话和业务	6
2.1.2 移动电话的无障碍使用功能	7
2.1.3 移动应用	7
2.1.4 转接服务和获取应急服务	8
2.2 无障碍使用移动电话的发展趋势、要求和导则	8
2.2.1 导则和建议	9
2.3 电视/视频节目无障碍获取政策框架	9
2.3.1 无障碍获取服务	10
2.4 无障碍电视/视频节目制作趋势、需求和导则	11
2.5 良好做法和可用案例研究	12
2.6 万维网无障碍访问的政策措施	12
2.7 万维网无障碍访问的趋势、要求和导则	14
2.8 无障碍ICT的公共采购	14
2.9 促进、实施和使用公共无障碍电信和ICT空间的要求和导则	15
2.10 针对残疾人的转接服务的要求	16
2.10.1 通过电信和ICT网提供的无障碍应急服务	16
2.10.2 促进国际电联电信和ICT无障碍获取（包括网页无障碍访问）的基于标准的商业解决方案	17
3 第3章 – 无障碍获取ICT用于教育	19
3.1 促进和实施无障碍电子教育的要求和准则	19

3.2	针对有读写困难人群的无障碍获取工具	19
3.3	无障碍电子教育实际应用的良好做法	20
3.3.1	无障碍的学校计算机中心	20
3.3.2	了解和设置教室计算机系统偏好 – 英国的初步自调节体系	20
3.3.3	支持残疾学生学习的移动电话策略	21
3.3.4	电子学习、语音和语言技术的无障碍获取技术	21
4	第4章 – 结论与总体建议	22
4.1	要在发展中国家面向残疾人 and 有特殊需求的人群实施有关电信和ICT无障碍获取的政策和监管框架需要考虑的主要问题	22
4.2	如何促进公共ICT场所的信息无障碍，如电信中心和公共付费电话	22
4.3	如何推广可由难以掌握读写能力人群使用的无障碍电子教育的无障碍获取工具	22
4.4	万维网无障碍获取的关键政策考量：	23
4.5	无障碍移动电话和服务领域的关键政策考量：	24
4.6	成员在制定有关无障碍获取音像媒体内容的政策和开发服务中确定的关键问题	24
4.7	公共采购领域的重要考量	25
4.8	提高所有利益攸关方对无障碍政策和技术发展趋势的认识和了解，以加强宣传效果	25
4.9	最后的意见 – 思路	26
	Abbreviations and acronyms	27
	Annexes	30
	Annex 1: Good practices and achievements in ICT Accessibility worldwide	30
	Annex 2: Resources and tools	43
	Annex 3: Accessibility related to other ITU groups and ITU-D cooperation with other organisations	45
	Annex 4: Technology trends of relay services, international standardization trends in line with ITU-T	47
	Annex 5: List of contributions received for consideration by Question 7/1 during the 2014-2017 study period	49

i. 引言

2006年12月13日，联合国大会批准了《联合国残疾人权利公约》（UN CRPD）。各国于2007年3月30日开始签署《残疾人权利公约》（CRPD），截至2009年2月16日，共有137个国家签署了该公约，其中81个国家亦签署了“任选议定书”。截至2016年7月，共有160个国家核准，166个国家签署了该《公约》，且这两个数字还在持续增加。CRPD不仅确立了基本原则，而且确立了国家确保残疾人（PwD）对包括互联网在内的电信/ICT进行平等接入的义务。

国际电联绝大多数成员国已核准了《联合国残疾人权利公约》。《公约》将ICT无障碍获取定义为普遍无障碍获取权利的重要组成部分，其重要性与物理环境和交通工具的无障碍获取相同，并阐述了将残疾人排除在平等参与社会之外的风险。《公约》蕴含了残疾人必须能够与其他人平等享受人权和基本自由的原则。它为各国制定的现行政策和方案，如电话的普遍服务政策、视频节目制作和/或网络无障碍获取提供人权依据，并为缺乏这类政策的缔约国制定了清晰的路线图。

《公约》第9条规定了成员国的一般义务，以确保残疾人可平等接入信息通信技术系统并享用向公众提供的相关设施和服务。第21、29和30条详细论述了这一问题，并指出，媒体、通信和ICT可作为扩大残疾人表达意见、获得信息、参与政治和公共并参加文化生活、娱乐、休闲和体育活动权利的平台。《公约》第3(f)章亦将无障碍获取性确定为其八项原则之一。

ii. 情况说明

据世界卫生组织（WHO）估计，全球有10亿人患有某种类型的残疾。根据WHO统计，大约80%的残疾人生活在低收入国家，患有耳聋和听力受损疾病。考虑到可在绝大多数发达国家看到的老年群体数量日益增加，残疾人的数量可能会继续上升。据联合国教科文组织（UNESCO）估计，全世界15岁（含）以上的人口（约占世界人口的11%）中约有7.74亿人为文盲，而其中三分之二（4.93亿）是妇女。应进一步注意到，其中又有52%生活在南亚和西亚，22%生活在撒哈拉以南的非洲。

人们普遍认为，对于世界各国公民而言，获取电信/ICT服务对于社会、文化、经济、政治和民主发展以及行使若干基本权利至关重要。在信息社会世界高峰会议（WSIS）上，其《原则宣言》和《突尼斯承诺》均强调，电信/ICT在生活的方方面面均发挥着极为重要的作用。此外，WSIS认识到，应特别关注残疾人和患有老龄残疾的老年人的需求。

ITU-D第1研究组第7/1号课题（2014-2017年）是由2014年世界电信发展大会（WTDC-14）委托研究的，以便成员国、部门成员、部门准成员、学术成员、相关国际和区域性组织、公共和私营机构以及民间团体组织制定政策和支持开发技术解决方案，克服残疾人使用电信/ICT时遇到的困难。

第7/1号课题的工作计划旨在为ITU-D研究组与会者（成员国、部门成员、部门准成员和学术成员）开展并强化针对残疾人无障碍获取ICT的能力建设。第7/1号课题的预期输出成果包括：

- 提高成员对无障碍获取问题的认识；
- 开展/增强成员有关无障碍获取问题/工具的能力建设和/或培训；
- 根据成员提供的ICT无障碍获取、政策、战略和最佳做法开展案例研究；
- 改进无障碍获取政策、战略和最佳做法的对话会议；
- 针对促进并落实残疾人和有特殊需求人员以及在阅读和书写方面存在困难人员无障碍获取电信/ICT业务和解决方案制定政策并落实战略，促进与成员国开展适当的讨论；
- 就无障碍获取领域的最佳做法、政策和项目开展竞赛；
- 选出无障碍获取战略、政策和项目方面成绩最突出的成员国并对其进行表彰；
- 展示现有的商业解决方案；
- 起草一份无障碍获取问题的报告，提供建议和导则。

基于上述预期输出成果，本报告旨在针对以下研究内容介绍最佳做法，概述面临的问题并提出建议和导则：

- 必须如何变更现有的法律法规，才能促进无障碍获取ICT？
- 如何提高电信中心和公共付费电话等公共ICT空间的无障碍获取性？
- 哪些公共采购要求（包括有关电信/ICT的商业最佳做法）应适用于残疾人？
- 无障碍使用移动电话有哪些要求？无障碍观看电视和视频节目有哪些要求？
- 无障碍上网有哪些要求？
- 在阅读和书写方面存在困难的人员如何使用无障碍获取工具？
- 已经实施了哪些无障碍获取最佳做法、政策和项目？
- 全球ICT市场中已有哪些商业解决方案？
- 可确定哪些潜在的实际应用来推动无障碍获取电子教育？

1 第1章 – 电信和ICT无障碍获取政策与监管框架

1.1 为何要促进残疾人和有特殊需求群体无障碍获取电信和ICT?

了解残疾人（PwD）的需求对于探索促进ICT无障碍获取的合适方法至关重要。

在全球范围内，人们已公认在网络、电视、移动和公共接入平台方面促进无障碍获取ICT可增强残疾人的能力。许多残疾人面临各种障碍和问题，无法充分享受ICT带来的好处，这是一个事实，也是确实存在的问题。

促进并实现残疾人无障碍获取电信和ICT有许多理由。在许多国家（主要是发展中国家），残疾人不愿意使用ICT，因为他们无法以无障碍获取的方式享受ICT服务，这是一个众所周知的事实。在很大程度上，互联网接入的匮乏使得残疾人难以扩展知识，且由于网络和移动不具备无障碍获取性，他们也很少使用社交网络。法律未做出具有约束力的规定，缺乏资金和对现有无障碍服务认识不足，以及进一步推动其发展的需求，仍是面临的主要挑战。

在通过更新现有立法和促进ICT无障碍获取改善现状方面，国家监管部门和政府机构可发挥关键作用。尽管认识到任何政策的核心目标均是采用各种ICT设备消除不同残障人员使用ICT的障碍，但各国监管机构和政府部门缺乏实现这一目标的知识 and 资金。尽管提出了“没有我们的参与，就无法为我们谋福利”的口号，但决策机构并不清楚残疾人的心声。态度的改变应与解决法律问题同步推进。

1.2 残疾人和有特殊需求群体无障碍获取电信和ICT的法律、政策和监管框架

本着促进成员参与无障碍获取ICT问题的能力建设这一宗旨，国际电联电信发展局（BDT）与G3ict（全球ICT包容性举措）合作起草了《示范性信息通信技术无障碍获取政策报告》，作为各国决策机构和监管机构制定无障碍获取ICT政策框架的一种工具。可采用国际电联的所有六种正式语文及无障碍阅读的电子书格式查阅该报告，它可协助各国了解促进残疾人无障碍获取的一般步骤和必要条件，并在它们能够调整适应国情的领域提供指导。成员还可从ITU/G3ict残疾人电子无障碍获取政策制定者工具包（www.e-accessibilitytoolkit.org）获得指导。

在国际电联各成员国中，相关部委负责制定有关ICT行业的政策。这些政策需纳入一般性政策框架。尽管政策是由政府制定的，包括监管机构、私营部门、民间团体和残疾人组织在内的不同利益攸关方在政策制定进程中各抒己见并对政策结果施加影响。这些政策有必要形成可执行的法律、法规和/或许可条件。

但是，与此同时，在各成员国中，显然需要对现有法律法规进行重大变更，才能提高ICT的无障碍获取性，推动无障碍获取ICT领域的发展。

发展中国家面临的共同挑战涉及普遍服务义务，它应考虑残疾人在无障碍获取方面的需求。普遍服务法律和监管框架应将无障碍作为普遍服务的一个明确目标包含在内，普遍服务基金也应予以考虑，也有必要在各级教育中包括无障碍获取ICT。在制定或更新

任何有关无障碍获取ICT的一般政策或法律的过程中，都应在所述过程的概念形成阶段即让残疾人及其代表和/或相关组织/机构参与进来。

1.3 对现有法规进行必要变更，以提高ICT无障碍获取性的导则和建议

许多国家正在修订其广播或ICT立法，以便解决融合和宽带引入等新出现的问题。这正是将旨在推动无障碍获取的重大修正纳入新法律的良机。换言之，决策者或许希望特别为加强ICT无障碍获取启动对现有法律的修订进程。

世界各国采用不同的监管方式，包括从行业自律和共同监管的“宽松”监管框架到要求颁布法规的更传统的监管方式，具体做法则要视相关方式能否与具体情况相匹配而定。

根据《示范性信息通信技术无障碍获取政策报告》，监管机构履行促进ICT无障碍获取的职责包括通过起草和执行法规实施政策、确定目标和许可条件、监督并履行义务，起草或批准行为准则并开展对外宣传和磋商等。

但是，绝大多数发展中国家的国家监管机构并未将ICT无障碍获取列在其工作日程之首，因此仍依赖于行业自觉采取行动。各国监管机构需采取积极措施并考虑采取必定改善当前现状的措施。

现有ICT法律为促进残疾人无障碍获取ICT而需做出的修改或“立竿见影的措施”，其中包括：

- 修订现有ICT政策、立法和法规以促进实现ICT无障碍获取；
- 建立ICT无障碍获取委员会，以便围绕这些经修订的ICT政策、立法和法规的制定与残疾人开展磋商；
- 使残疾人和残疾人组织了解经修订的ICT政策、立法和法规；
- 通过ICT无障碍获取的技术和服务质量标准；
- 补充并修订促进实现ICT无障碍获取的关键ICT立法定义；
- 修正普遍接入/服务法律和监管框架，将ICT无障碍获取作为普遍接入/服务和普遍接入/服务基金的明确目标纳入其中；
- 确保服务质量要求考虑到残疾人的特定需求并为无障碍获取服务制定服务质量标准；
- 修订应急通信法律框架，确保残疾人无障碍获取应急服务；
- 设立明确目标并通过年度报告将目标落实到位；以及
- 修正残疾人立法，将ICT无障碍获取引入其中。

相关导则和建议应与ITU-D、ITU-T、ITU-R数据库和其他外部资源保持一致。更多详情，请参见附件2。

1.4 当前残疾人和有特殊需求群体无障碍获取电信和ICT的政策和规章概述

为在ICT行业开展运营，服务提供商需要得到提供具体服务的授权许可（可包含多重服务，通常是技术中立的），条件由许可颁发机构（通常为国家监管机构）和许可获得者做出规定。在大多数情况下，确保ICT无障碍获取的规定可能包含在许可条件中并作为一实体应履行的义务。

但是，自愿措施只能考虑用于监管和法律框架支持这种手段的国家。在这些国家中，法律为通过自愿性措施实现ICT无障碍获取提供了更加深层的保障。然而，在许多这类国家，这些自愿措施目前不承认残疾人组织及其在有关标准通过或商用解决方案选择以及有效实施的公共磋商中的参与。

在无障碍获取ICT规章中可广泛适用于全行业的规则并落实统一的标准和要求，确保采用协调一致的方式是有益的。但是，法规是在经过相关利益攸关方均有机会各抒己见的磋商进程后制定的。在发展中国家，自愿性行业措施并不能在瞬息万变的技术环境中有效地促进平等获取ICT，因为监管机构并不能完全控制市场参与方。

在一些监管体制下，ICT无障碍获取要求包含在许可条件中，而在其它体制中则可能包含在一般性规定中。对于允许自律或共同监管的国家，ICT无障碍获取可通过行为规范予以实现。所采用监管工具的效率取决于该国的法律框架和行业结构。

在许多国家，ICT法律没有对通过“行业准则”或“行为规范”执行的自律或共同监管体制做出规定。此外，法律不承认包括残疾人组织在内的行业协会或其它机构。

ICT法律、政策和法规普遍支持信息通信技术的普遍接入原则。其做法是重点提供一个方便ICT网络部署，推广经济实惠的服务和产品，保护消费者并提供可靠应急服务的框架。但是，残疾人因素并非总是包含在这些业务提供中。

1.5 优秀做法、面临的问题及可用的案例研究

在全球范围内，残疾人在获取信息、接受教育和就业等方面每天均面临着各种困难，而平等获取ICT可以消除这些障碍。

其中残疾人在与ICT业务互动方面所面临的一些问题包括有必要无障碍获取在移动手机、电视、具备有效协助残疾人使用ICT功能的平板电脑和电脑等设备上已经成为常见业务的ICT业务。这些功能包括可在屏幕上放大文字或仅通过触摸即可定位控制符，可使用免费获取或在获得补贴或补助后成本很低的屏幕阅读软件或自适应键盘等辅助技术。此外，有必要为残疾人及为其提供帮助人员提供如何使用具有无障碍获取功能的自适应技术。

由于ITU-D开展了有关向其成员宣传ICT无障碍获取政策的工作，美洲地区2014年在巴西，2015年在哥伦比亚并于2016年在墨西哥开展了一系列“美洲无障碍—面向所有人的信息通信”活动。美洲无障碍获取活动已成为美洲地区残疾人无障碍获取ICT的重要活动之一。这些活动不仅要汇集所有利益攸关方，合作落实无障碍获取ICT政策，还要提高认识，提供培训，分享最佳做法并跟踪本地区在此方面取得的明确成果和进展。这些活动取得的积极成果可成为其他地区参考学习的范例。

以下为第7/1号课题研究组会议期间提交的可用案例研究汇总。

墨西哥2013年6月开始了电信改革，修正其《宪法》。墨西哥的经验表明，如果无障碍获取不是政府的首要任务，改革意识可能来自民间团体。此外，民间团体正在寻求监管机构在该领域创建并落实二级立法。宪法修正案并不直接涉及无障碍获取ICT问题。国家监管机构已采取明确行动，落实电信业务用户的权利并进行跟踪，其中就包括残疾人平等获取电信业务。该法律框架给予国家监管机构颁布残疾人无障碍获取电信业务导则的授权。此外，墨西哥联邦通信研究院认识到在无障碍获得电信和ICT业务方面获得精确量化数据、全面掌握情况的必要性，以便可做出适当决定，制定并落实针对残疾人的公共政策。

在**巴西**，监管部门受理有关缺乏残疾人所面临无障碍获取问题的投诉。2016年5月31日发布的新规定拓展了残疾人可获得的权利，例如以无障碍提供给方式（盲文，借助巴西聋人手语“Libras”翻译的协助与任何人交谈，并采用通信中介中心（CIC）进行视频呼叫）获得电信服务方案与合同及其他相关信息。

大韩民国保证残疾人（包括老年人）无障碍获取ICT产品、系统、服务和设施，无论身体或技术方面存在的困难是什么。在实现这一目标的过程中，韩国注重使政府在制定ICT无障碍获取法律制度、社会能力标准化战略方面发挥同等作用，如提供培训、咨询并促进非公共部门的其他利益攸关方参与。虽然重点放在无障碍上网和无障碍使用移动应用上，工作焦点正慢慢转移到救灾和对残疾人广播的监管等其他领域。2015年修订了无障碍收听广播条例，以将自然灾害等特殊情况考虑在内。在某些情况下，政府为无障碍方案的费用提供支持，以保障残疾人无障碍获取广播的权利。

非洲区域的绝大多数国家缺乏有关残疾人数量、其具体需求的类型及根本致残原因的确切且准确的统计数据。没有进行过有利于我们对非洲地区各国已有的残疾人统计数据及其具体需求进行更新的定期（年度）研究和调查。在非洲地区，残疾人很难获取信息通信技术，而且那些可有限获取信息通信技术的残疾人均居住在城市。此外，绝大多数非洲国家并没有专门针对残疾人的电信/ICT政策或措施。

在**肯尼亚**，多年来，一直在为对所面临的挑战做出响应而进行法律体系的调整。肯尼亚政府通过国家监管机构启动了旨在协助残疾人无障碍获取ICT的项目。国家监管机构施行了监管审批工具，以确保残疾人的要求和利益得到充分考虑。在促进履行其确保普遍获取电信业务和设施的职责过程中，国家监管机构支持在教学机构设立针对残疾人的ICT中心。此举带来了很多好处，但仍存在着涉及维护、缺乏可以提供ICT培训的教师、需要更多设施和可持续性等一些的问题。此外，肯尼亚通信管理局实施了支持在残疾人学习机构中建立ICT中心的项目。该项目是一项多利益攸关方举措，涉及政府和私营部门。残疾人组织继续在这个项目上发挥关键作用。虽然可持续性仍然是个挑战，但监管机构继续支持学校设施的网络连通和维护，这种支持未来几年将由普遍服务基金（USF）接管。

马里缺少有关残疾人数量、其特定需求以及造成残疾的原因的准确统计数据。在农村和城区，残疾人均无法享受信息通信技术。相关部委及国家监管机构应采取合理适当的措施，规定公共网络接入和互联条款，以确保所有用户可在公平和平等竞争的框架内自由通信，并承认残疾人无障碍获取相关业务和设备的权利以满足残疾人的需求。

塞内加尔在就停止歧视和改进残疾人生活水平开展工作方面取得了长足进展，尤其是在移动性以及卫生和教育服务的获取方面。“残疾人就业中心”（CHAT）已成为国家信息管理局（ADIE）的一部分，重点关注数字鸿沟并支持社会包容性。

像许多发展中国家一样，贝宁的电子通信和邮政法包含了促进残疾人无障碍数字获取的条款，但其落实力度不大。根据法律，设有国家应保证普遍数字接入的社会类别，但为了满足这一要求，必须指定并实施残疾人无障碍使用电子通信的政策。

为应对ICT无障碍获取方面的挑战，几内亚政府制定了将残疾人包容在内的规划。教育被确定为促进残疾人融入社会和利用新技术的关键因素。但是，目前还没有具体法律要求实现残疾人就业和无障碍获取ICT。可以想见，相关技术使用本国语言可有效落实针对残疾人的教育计划并由此有助于消除贫困并确保残疾人融入社会。在此方面，有必要在各个层面宣传此类计划的益处。

科特迪瓦共有约3 400 700人身患残疾（世界卫生组织的数据），该国于2014年1月10日批准了《残疾人公约》。科特迪瓦承诺该国将逐步实现电信/ICT的无障碍获取。该国的数字经济政策和法律制度框架考虑到了残疾人的问题。负责实施政策的部门是负责不对称监管的监管机构ARTCI、负责普遍服务问题的国家普遍服务局、负责频率管理的象牙海岸频率管理局（AIGF）以及负责为政府制定政策和法律的数字经济部。

在欧洲地区，尤其是东南欧（SEE）的发展中国家中，尽管现行法律框架保证残疾人免受歧视，平等机遇和社会包容性，但无障碍获取ICT的水平仍然很低。造成此现象主要是由于缺乏强制性条款，未在不同利益攸关方的活动之间进行协调与统一，资金不足和对可用的无障碍获取服务和技术缺乏了解。例如，在欧洲地区的某些国家，包括（阿尔巴尼亚、波斯尼亚和黑塞哥维那、塞尔维亚共和国和黑山）。但是，进步还是明显的 – 无障碍获取性已被确定为未来几年政府的工作重点，国家监管机构正在着手鼓励决策机构在其国内法律框架中增加国际性条款且软件服务的专业水平也在提高。国家监管部门和政府机构应在更新现有法律体系并提高ICT无障碍获取水平方面发挥关键作用。

关于ICT无障碍获取政策和法规的优秀做法与成就的其它参考内容，见附件1。

2 第2章 – ICT无障碍获取生态系统中的技术和解决方案

2.1 移动通信的无障碍获取政策框架

从政策角度而言，移动运营商提供具有无障碍获取功能的移动手机方面不应存在任何挑战。¹但是，转接等其他业务需要具体的政策干预。

《示范性信息通信技术无障碍获取政策报告》包含了监管机构和其他政策参与方可如何落实相关政策，确保促进提供无障碍获取移动电话和服务的条款已就绪的实用建议。它还包含了移动行业的示范性行动准则及一套针对监管机构的示范性规章。

政策建议包括：

- 应与残疾人协商制定所有政策；
- 监管机构应考虑使用普遍服务/接入资金补贴为丧失听力且无法以正常使用电话的人群提供国内转接服务的电话运营商；
- 监管机构应与适当的应急服务和移动电话运营商以及移动电话制造商合作，确保残疾人平等获取应急服务；
- 监管机构应与移动电话运营商和制造商联系，确保为残疾人提供价格可承受的、无障碍移动电话；
- 监管机构应与移动电话运营商联系，确保充分提供有关这些移动电话的信息，其中包括与助听器等辅助技术的兼容性信息；
- 移动电话运营商应考虑为不愿以及不可能使用语音服务的聋人用户提供数据或SMS单项功能套餐。

2.1.1 无障碍使用电话和业务

世界上移动电话的数量超过任何其他ICT设备。根据国际电联的预测，在用的移动电话数量达到了70亿部。移动电话的类型包括从接听拨打电话和消息的简单手机到可以接入互联网和其它应用的高级智能电话。移动电话不仅用来拨打接听电话，还日益成为人们访问互联网的主要手段。移动电话和移动业务具备无障碍访问功能并与助听器等辅助技术相兼容，且残疾人可与其他人交流并通过接转服务获取应急服务，这一点对于残疾人而言非常重要。

《联合国残疾人公约》²规定了要求签约国确保残疾人平等获取ICT的一些义务。其中，第4和第9条中包含的这些义务对《公约》中规定的教育、就业、交通、社会和文化生活等其他基本权利有着深远影响。因此，在移动电话和业务拥有同等的选择和获取权利对于残疾人享受这些权利至关重要。

¹ 有关市场中现有移动电话所含无障碍获取功能方面的信息，参见GARI无障碍获取移动业务数据库，网址为<http://www.mobileaccessibility.info/>。

² <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>。

为对这种关注做出响应，ITU-D与G3ICT合作编写了《移动电话和服务无障碍使用报告》。³该报告以联合国六种语文编写，汇总并分析了各国正在实施的主流无障碍移动电话和服务的不同途径。这包含了实用信息和案例研究，可作为推广无障碍使用移动电话和移动辅助技术的基础。

2.1.2 移动电话的无障碍使用功能

许多现代移动电话包含了可允许各种人群使用这些电话的功能。

- 基本型移动电话的简单功能包括在“5”这个键上有一个可触摸的小点，这个小点可使视力受损的人移动手指，在键盘上找到正确的数字。
- 现在的许多电话采用图标而不是嵌套的文字菜单，此举可使智障人员更容易使用电话。
- 绝大多数智能电话可读出屏幕上的文字，甚至可以声控，使得无法看屏幕或触摸屏幕的人可以使用电话。

移动电话中协助残疾人的无障碍使用功能可使许多人在使用移动电话时受益。许多人使用小触摸点进行拨号，无需看着屏幕。操不同语言的人，甚至三岁儿童均可认识图标界面。此外，人们越来越多地使用文本朗读和声控功能，用来阅读邮件并在移动过程中使用电话。

许多全球移动生产商和各国移动电话运营商已开始提供内置无障碍功能的电话。但是，在各国内部及各国和各地区之间存在支持持续生产具备无障碍使用功能的移动电话并由移动运营商提供这些电话的政策规定非常重要。移动电话运营商提供其产品和服务无障碍功能信息并鼓励残疾人尝试和使用这些功能，这一点也至关重要。

另一个应考虑移动电话重要功能是其与助听设备的兼容问题。许多移动电话可与助听兼容，这意味着它们：a) 助听用户使用移动电话时不会干扰，也不会产生啸叫，但b) 它们也在改善助听器中移动电话的音质，使得用户可以听清线路另一端呼叫人的讲话。移动运营商必须支持这种重要的功能。

2.1.3 移动应用

除现代移动电话提供的功能外，它们也可使用各种为残疾人提供便利的应用。可用且价格可承受的应用数量的增加是过去十年中移动电话领域最了不起的成就，现有多种辅助技术可帮助残疾人进行沟通、旅游和更加独立地生活。⁴

其它关于移动应用的优秀做法和取得的成就，见附件1。

³ <http://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Pages/Persons-with-Disabilities.aspx>。

⁴ 不同应用商店的清单和说明参见<http://www.distimo.com/>。

2.1.4 转接服务和获取应急服务

许多移动电话用户可能存在听力和/或讲话困难。无论是什么类型的多大程度的残疾，他们可以通过移动电话与他人交流这一点很重要。尤其重要的是可以在遇到紧急情况或事故时与应急服务交流。

转接服务指可使人们通过电话拨打、接听并完成通话的人工服务。现在已有各种转接服务。

接转服务就是一种使失聪者能与听力正常的人进行沟通的方式（使用他们选择的任何一种方式）。反之亦然。⁵

典型的转接服务涉及失聪呼叫者在转接服务中心话务员的协助下与听力正常的人进行沟通。取决于所提供转接服务的复杂程度，耳聋者可通过手语、文字或声音与话务员沟通。呼叫另一端听力正常的呼叫者可正常地与话务员讲话，通过话务员与耳聋呼叫者沟通。针对失聪者的四种转接服务有：文本接转服务；语音携带文本接转服务；字幕电话接转服务；视频接转服务。

尤其重要的是残疾人可以在遇到紧急情况或事故时与该国内应急服务提供商进行交流。其他重要服务还包括查询电话号码。

2.2 无障碍使用移动电话的发展趋势、要求和导则

新的发展趋势正在不断涌现，其中一些趋势表明iOS、安卓、Windows以及黑莓等主流移动操作系统均以公开应用编程接口（API）的方式为各类残障人士提供广泛的内置无障碍使用功能，使开发者能够开发无障碍使用的应用程序。鉴于设备无障碍使用性的重大变革，国际电联成员的主要工作包括使开发者知晓如何利用无障碍使用API。

在许多情况下，手机本身不是问题，而问题在于老年人和残疾人在紧急情况下如何使用手机。出现紧急状况时，精神或许会受到影响因此合理操作手机可能存在困难。

在此情况下要发送SOS信息，则手机用户身体的某一部分必须能够接触到应急键。紧急情况时按下此键后，应急信息和位置信息可被发送给家人、警察、医院等。使用此功能必须安装应用软件。

此外，辅助技术产业正在越来越多地利用数量庞大、增长快速的移动辅助应用，移动辅助应用在老年人和残障人士中的普及和运用远胜于基于电脑的应用程序。联网可穿戴设备为老年人和残障人士的服务创新打开了广阔空间，涉及了远程监控、增强的感知信息和解读、以及本地实时定位服务。

已证明物联网和移动应用使新的发展机遇充满了巨大潜力，改善了老年人和残障人士的生活品质。各种主流智能手机和平板电脑的无障碍使用功能使这些设备成为老年人和残障人士获取信息、交流、参与休闲活动、以及进行环境控制的必然选择。

⁵ “实现提供给失聪者的转接服务”，《国际电联新闻双月刊》2011年6月http://www.itu.int/net/itunews/issues/2011/05/pdf/201105_30.pdf。

主要发展机会还包括：移动技术支持的智能家庭、旅游和公共空间方面的物联网应用、移动医疗及健康应用和服务、紧急情况与个人安全应用和服务。但是，应考虑数量日益增加的联网“设备”的频谱和网络管理后果，据预测，未来5年联网“设备”的数量将达到250亿。研究问题可包括但不限于带宽、时延、隐私、助听设备（ALD）的干扰和禁用、短距设备（SRD）以及其他辅助技术。

但是，在拥挤的2.3-2.4GHz频段内存在许多不需要执照的设备，它们将受到影响。在此方面将面临许多问题。例如，考虑到学校同时使用WIFI、无线麦克风、音像设备和蓝牙等多种装置，其中还可能包括直接连接教师和学生以及日益普及的人工耳蜗植入系统的ALD以外的报警系统和M2M。另一个许多学校和教育机构面临的普遍情况，是移动网络发射机在人们不知情的情况下被安放于学校的建筑上。在学校安装的2.3-2.4GHz频段发射机，很可能在基站和用户设备（UE）之间造成干扰。

如不在《无线电规则》中规定保护它们的适用标准，这些装置将受到负面影响，它们甚至可能停止工作，尤其在辅助听力障碍者的医疗装置和ALD出现问题时，会给人们的生命安全造成负面影响。

根据《联合国残疾人权利公约》（UNCRPD）的要求推进工作的唯一现实途径，似乎是为残疾人和医疗装置确定受到保护的频谱和地位。

其它关于移动电话服务于无障碍获取的优秀做法和取得的成就，见附件1。

有关利用ITU-D第1研究组、ITU-T第5、第16研究组及JCA-AHF现有数据的发展趋势、要求和导则的进一步参引，参见附件2中的链接。

2.2.1 导则和建议

在设计或制定标准之前，显然需要并强烈建议ITU-D第1和第2研究组与其他两个国际电联部门（ITU-T、ITU-R）以及其他相关国际组织之间开展协调，因为需要达成全球互操作性。

无障碍获取标准对于将设备和服务提供给最为广泛的人群使用至关重要，同时是实现互操作性和所需服务质量的保证。在此方面，ITU-T和ITU-R研究组的课题制定了一些有关无障碍获取的建议和导则。更多参考，见附件3。

2.3 电视/视频节目无障碍获取政策框架

电视/视频节目的无障碍性针对所有的利益攸关者：决策者、监管机构、学术界、研究人员、行业，包括电影行业、消费电子产品制造商，以及残疾人组织，以便通过创建创新的解决方案来提高无障碍性。

欧盟即有约8000万人身患一定程度的残疾。由于欧洲人口的日益老龄化，预计到2020年该数字将上升至1.2亿。无障碍获取是他们平等参与社会并在其中发挥积极作用的一个前提，也可有助于确保实现智慧、可持续和包容性增长。

示范性包容性社会意味着所有用户均可无障碍获取⁶。针对媒体无障碍获取领域的普遍设计示范促进了采用各种方式访问媒体，也符合残疾人“没有我们的参与，就无法为我们谋福利”的口号⁷。

无障碍获取不是仅仅针对一小族群体的独家服务，认识到这一点很重要。不应忘记，媒体访问服务也是面临被边缘化、身患自闭症和读写困难的人群学习语言、融入社会的一个强大教育工具。它面向所有人，其中特别包括：残疾人、老年人、无学习能力或居住在语言区的人。

各国均制定了更多落实无障碍服务的法律和规章。确定了接入服务的指标。如何发展业务，实现100%的覆盖是一项挑战，因为解决生产成本、工作流程、技术或实际交付等问题并非易事。为此，国际电联与3Gict起草了《示范性信息通信技术无障碍获取政策报告》。⁸该报告是ICT决策机构和监管机构将《联合国残疾人权利公约》中广泛的ICT和电视无障碍要求转化为各国法律。它也旨在协助决策机构和监管机构开展能力建设，确定可确保其国内残疾人广泛地无障碍获取ICT的切实措施的实用指南。

考虑到广播是一个高度管制的领域，在实施无障碍服务规定以及协调国家规定与国际标准方面，监管机构和立法机构扮演着关键的角色。特别地，在数字化转型中，立法机构和监管机构被认为是利益攸关方，需要对无障碍电视服务有深刻的理解。

2.3.1 无障碍获取服务

无障碍服务与语言以及翻译问题直接相关。重要的是不仅要懂得需要无障碍提供的节目的语言，还要了解翻译模式，因为翻译模式因国别和题材而有所不同。在欧洲，有四个国家（意大利、德国、法国和西班牙）采用配音，而波兰等国则采用画外音，其余国家均使用翻译字幕。另外题材也有一定影响。例如，少儿节目不能使用翻译字幕，因为幼儿看不懂，再如纪录片往往采用画外音。另一方面，对于日语电影，要确保日本以外国家了解影片对白，就需要翻译字幕、配音或画外音。

翻译字幕（subtitle）用于将一种语言的对白翻译成另一种语言，而说明字幕（caption）则用于转录同一种语言。在上述情况下就是将日语转录为日语，同时加入声音注释和话者识别。音频翻译字幕针对有阅读困难的人群，手语亦用于第一语言非书面语言的人群：聋人。音频描述⁹是另一种无障碍服务，以口述形式提供视觉信息，此链接中是有关提供、传送和宣传电视和电影音频描述的工具包。

技术在媒体无障碍获取方面发挥着重要的作用。用于提供同一服务的不同工作流程都依靠相关技术。例如，可利用速记机、高速键盘（velotype键盘）、软件翻译字幕/说明字幕编辑器，通过语言技术和重述，最后通过自动对白字幕翻译和说明字幕转录生成翻译字幕和说明字幕。纵观现有技术和不同质量，在大多数情况下提供无障碍服务是有可能的。

⁶ http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=51342。

⁷ <http://www.un.org/esa/socdev/enable/iddp2004.htm>。

⁸ http://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Documents/ICT_Accessibility_Policy_Report.pdf。

⁹ http://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Documents/International%20Audio%20Description%20Toolkit_updated%202016.pdf。

由于模拟到数字的切换以及宽带和广播的融合，为在不同平台、以不同格式实现无障碍获取服务以及方便用户根据个人需要调整所选服务创造了条件。目前，翻译字幕和说明字幕可根据用户选择的屏幕尺寸、对比度、色彩以及在屏幕的顶部还是底部进行定制。新的连网电视支持多语言翻译字幕、多声音以及多语言的音频描述和音频翻译字幕。手语可通过宽带传送并无缝集成到节目中，显示在不同的屏幕区域，还可选择手语译员显示的大小。工作流程也发生了变化，实现了远程办公和协同工作。

提供无障碍服务时，成本似乎是考虑的主要因素。亦应将不同的业务模式、工作流程和技术纳入考虑。一些国家已证明学校众包是制作音频描述或翻译字幕的有效方式。商业部门对无障碍服务的资助，包括广播和有线电视网、节目制作商以及广告商，可视作为一种能为电子无障碍性带来市场机遇的商业模式。

除了资金和资源，在广播公司提供无障碍的主流节目时，另一个关键性限制因素是专业技能问题。但有几个因素有助于提高专业技能，包括进行适当的能力建设、为广播公司和相关各方提供专门的培训机会，以及提供交流最佳做法和经验的机会等。

提高无障碍水平的另一个关键问题是加强在标准制定方面的协作，制定路线图和里程碑，作为成功实现无障碍电视服务的强制性先决条件。有人对没有一直顾及残疾人用户需求表示关切。例如，尚无标准列出用户对转换技术（avatars）（包括面部表情、肢体语言和其他实现准确沟通的必要身体提示）的需求。可将有关对转换技术进行标准化的ITU-D第7/1号课题与ITU-T第26/16号课题的工作结合起来，解决这一问题。

2.4 无障碍电视/视频节目制作趋势、需求和导则

随着越来越多的国家转换到数字电视，相对于开放式字幕，从技术上已可提供隐藏式字幕。一般认为，要有效收听音频描述，还要有专门的接收设备遥控装置。因此，采购接收设备时应加以注意。电子节目指南使用图标，从而相关节目是否有无障碍获取功能一目了然，如CC（隐藏式字幕）和AD（音频描述）等图标。在数字化转型中，应确保公共广播机构有足够的资金来提供无障碍服务以及紧急情况信息和公众安全公告。此外，关键要为无障碍获取服务的提供设置具体目标和报告要求。

对于视频点播服务的无障碍获取问题，在一些国家，对用户而言，视频点播服务描述（描述可用无障碍获取功能的电视、电影、DVD或蓝光）之间存在差异。目前正在开展一些项目，研究在新的混合广播宽带电视中实现媒体无障碍获取的可能性以及在预录节目中回顾性地添加说明字幕的新的实时字幕系统。其中一些技术使用语音识别软件。

IPTV以及说明字幕和音频描述的无障碍获取功能基于互联网，因此可能最易于实施。由于某项国际标准中已涵盖所有方面（如ITU-T H.702 2015标准“IPTV系统无障碍获取概要文件”¹⁰所示），减少了冗余度以及对已过时硬件和电视机的依赖。该标准已在巴西、卢旺达和日本得到实施。

¹⁰ ITU-T H.702: IPTV系统无障碍获取概要文件，可查阅：<https://www.itu.int/ITU-T/recommendations/rec.aspx?id=12648&lang=en>。

其他有关符合ITU-T第16研究组、ITU-R第6研究组和音视频无障碍获取跨部门报告人组（IRG AVA）建议书的电视/视频节目无障碍获取趋势、要求和导则的参考资料，见附件2。

2.5 良好做法和可用案例研究

根据欧洲区域的良好做法，各国市场占有率超过5%的各大电视台的广播节目必须带有手语或说明字幕。在一些国家，主要电视频道（如公共广播电视台加泰罗尼亚（Catalonia））的无障碍内容（带有不同语言的翻译字幕、说明字幕的内容）达到约70%，近90%的翻译字幕内容和音频描述见于少儿节目。

另一方面，在欧洲区域的一些发展中国家（阿尔巴尼亚、波斯尼亚与黑塞哥维那、塞尔维亚和黑山），残疾人节目总份额不到1%。这一比例在新闻节目中略高，因为一些资讯节目被翻译成手语。但这些节目每天的播出时间仅有几分钟或在非社交时间播出。声音电影每月在深夜播放一次。在一些国家根本不播放声音电影。几乎在所有国家，都没有针对残疾儿童的节目。

残疾人获取电影/视频媒体内容的权利仅能通过确定或增加强制配额来实现。这类节目应在黄金时间播出，并且应适用于所有音像节目内容提供商。除配额问题外，服务质量（无论是网页内容、隐藏式字幕还是音频描述）仍是一个挑战。制定技术标准/导则非常重要。

有关电视/视频节目优秀做法和所取得成就的其它参考，见附件1。

2.6 万维网无障碍访问的政策措施

在过去二十年中，网站已成为最重要的沟通形式之一，提供了前所未有的浏览新闻、娱乐、访问社交媒体的方式以及教育和就业机会。公共部门网站越来越多地向公众提供重要的信息和服务。许多人虽然有互联网连接和互联网功能设备，但却无法阅读网站内容、使用Web服务或进行交互。而且世界各地的许多网站在设计和开发时都没有考虑到无障碍获取因素。

已出台着重实现公共部门网站无障碍访问的网络无障碍政策的国家的初衷是（或“打算”）在适当时将这要求推广到私有部门。

联合国《残疾人权利公约》¹¹中包含一些要求缔约国确保残疾人公平获取信息通信技术的义务。这些义务主要包含在第4和9条中。提供残疾人可无障碍访问的网站是实现其权利的基础。

¹¹ <http://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html>。

万维网无障碍国际标准WCAG 2.0的四项主要的万维网无障碍访问原则包括：

- 可感知性：网站上的信息或服务以人们所需的任何形式提供给用户，如为盲人描述图像的替代文本（‘alt’ text）；
- 可操作性：用户可使用网站所有功能，如按键足够大，可用鼠标操作；
- 可理解性：用户可理解、使用信息，如指令简单明了；
- 稳定性：网站可兼容一系列不同设备和不同辅助技术，如盲人使用的读屏器。¹²

万维网无障碍访问政策的一个关键方面是其所涉及的网站范围。其中首先包含政府和公共部门网站，其次为关系公众利益的网站，如银行、电子商务、个人医疗提供方的网站。

公共采购是一个强大的工具，可通过这种手段鼓励市场生产无障碍商品和服务，并在公开招标中设置最低无障碍要求。ICT商品和服务亦应得到政策关注，并制定具体的无障碍政策。¹³

《示范性信息通信技术无障碍获取政策报告》中包含有关将提高网站无障碍性的措施纳入现有的相关政策的指南，还包含一项为尚未采纳相关政策的国家制定的示范性政策文件。

制定和实施上述政策（无论是独立政策还是纳入现有政策的要求）时有几点重要考量：

- 责任：确定负责实施政策的政府机构，如国家监管机构、负责整个公共部门电子政务、ICT或客户服务的机构；
- 磋商：确保在政策制定过程中听取残疾人及其他利益攸关方（如各国公共部门的网络开发人员、IT管理人员）的意见；
- 提高认识：确保相关机构了解政策；
- 通过标准设定明确的目标：使用和参考政策制定机构、残疾人组织和Web开发人员普遍接受的标准，以便在政策中设定明确的目标；
- 能力建设：为相关人员（包括IT人员、负责将内容发布到网站的人员和负责购买公共网站的人员）提供培训；
- 监测进展：如何衡量一致性和鼓励一致性。

¹² W3C/WAI 2.0版《网络内容无障碍获取导则》（亦称ISO/IEC 40500:2012）。

<https://www.w3.org/TR/WCAG20/>。

¹³ 国际电联学院免费在线提供有关无障碍ICT公共采购的培训：<https://academy.itu.int/index.php?lang=en>。

2.7 万维网无障碍访问的趋势、要求和导则

万维网无障碍获取政策应参考有关万维网无障碍访问的国际标准、W3C、2.0版网络内容无障碍获取导则（WCAG）。

万维网无障碍获取政策应：确定如何解决与公众部门网站升级相关的费用（使用普遍服务基金通过有关ICT基础设施的中央资金筹措实现）；落实工作的时间安排。这样做应考虑到新的网站版本与现有网站的更新。此外，应制定程序以监督按照有关新内容的国际标准（WCAG 2.0）在政策范围内创建无障碍网站的一致性以及报告实施情况的程序。

在欧洲，一项有关Web无障碍访问指令的提案目前正在最后定稿，其中要求成员国确保其公共网站实现无障碍访问。¹⁴ 2015年12月宣布了另一项称为《欧洲无障碍法案》的更一般性的指令，这项指令实施后会将无障碍要求推广到事关“公共利益”的在线服务，如网上银行和电子商务。¹⁵

例如，美国要求所有联邦政府机构将无障碍性作为采购任何ICT产品和服务（包括网站）的基本要求。这些规定称为1973年《康复法案》第508节，在向公众开放的网站的无障碍水平方面和web开发机构提供可无障碍访问的网站的能力方面都产生了显著影响。¹⁶

有关万维网无障碍获取的优秀做法和所取得成就的其它参考，见附件1。

有关ITU-T和W3C认可的网络无障碍性的趋势、要求和导则的进一步参考资料见附件3。

2.8 无障碍ICT的公共采购

公共采购平均占一个经济体国内生产总值（GDP）的10-15%。¹⁷

国际电联各成员国越来越多地将此作为实现各项经济和社会目标的战略工具。公共采购政策对全球市场无障碍ICT的发展具有重大影响，因此被视为一项解决方案。联合国《残疾人权利公约》规定，各缔约国必须确保“其公共采购程序包含无障碍要求”（第32段）。

美国制定了有关无障碍ICT的技术标准，并颁布了要求所有联邦机构在ICT采购中采用这些标准的立法。1973年《康复法案》第508节是一套可执行的ICT无障碍标准，规定联邦机构必须将其作为在采购ICT时供应商必须满足的一套强制性要求（或技术规范）。这套标准由美国无障碍委员会制定，于2001年纳入联邦采购法规。¹⁸

¹⁴ <https://ec.europa.eu/digital-agenda/en/web-accessibility>。

¹⁵ http://europa.eu/rapid/press-release_MEMO-15-6148_en.htm。

¹⁶ <https://www.access-board.gov/the-board/laws/rehabilitation-act-of-1973>。

¹⁷ http://www.wto.org/english/tratop_e/gproc_e/gproc_e.htm

¹⁸ 《康复法案》第508节（29 USC 794d），1998年8月7日经1998年《劳动力投资法案》（PL 105-220）修正。美国无障碍委员会。1999年。“电子和信息无障碍获取标准”（Electronic and information accessibility standards）。见：<http://www.access-board.gov/sec508/508standards.htm>

2014年3月欧洲公布了首套无障碍ICT标准：EN 301 549 “欧洲ICT产品和服务公共采购的无障碍要求”。¹⁹ 此标准是欧洲标准组织应欧盟委员会的要求（严格说是授权）制定的。已统一了EN 301 549中包含的无障碍获取要求，以尽可能与第508节标准中的规定相一致。²⁰

《示范性信息通信技术无障碍获取政策报告》中要求政府部门采购无障碍ICT设备和服务的公共采购政策有两个主要目标。

- 首先，采购无障碍程度最高的ICT备和服务，政府机构可为其雇员提供无障碍的工作环境，为公众提供无障碍的公共服务；
- 其次，无障碍ICT的公共采购为无障碍ICT解决方案开辟了市场。制造商和服务提供商有动力生产无障碍ICT设备和服。这有助于增强竞争，降低费用，使市场上的无障碍ICT产品和服务更加丰富。

用于公共采购的无障碍ICT政策和做法可：

- 确保公共机构在公共服务提供中利用无障碍的ICT解决方案，改善残疾人的生活；
- 向公众提供可由尽可能广泛的人群使用和无障碍获取的ICT系统和服务；
- 在公共部门内创建无障碍就业环境；
- 凭借政府的购买力，提高对ICT产品和服务的无障碍功能的市场需求；
- 鼓励行业争相设计、开发和提供无障碍程度更高的主流ICT 解决方案，从而增加无障碍解决方案的市场供应；
- 通过改变上述市场供需，促使市场以更低价格推出无障碍程度更高的ICT解决方案。

2.9 促进、实施和使用公共无障碍电信和ICT空间的要求和导则

许多发展中国家的互联网用户依赖公共接入点上网。此外，各类公民正越来越多地通过互联网访问商业和公共电子服务，以获得各类基本服务。公共接入对于发展中国家，尤其是连通性最低的国家至关重要，这些国家的语音、互联网和宽带普及率均低于发达国家。²¹

鉴于公共接入在向公众，特别是向无法独立获得ICT服务的人提供服务方面发挥的作用，应鼓励提供公用电话和公共社区互联网接入点的服务提供商和供应商，确保残疾人能够平等享用和获得电话和计算机及其安置设施，并做到有求必应。

¹⁹ 欧洲电信标准协会（ETSI）。2014年。“EN 301 549 欧洲ICT产品和服务公共采购的无障碍性要求”。

见：http://www.etsi.org/deliver/etsi_en/301500_301599/301549/01.01.01_60/en_301549v010101p.pdf

²⁰ 美国无障碍委员会目前正在进行使新版第508 549节与EN 302 549保持一致的工作：

<https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards>

²¹ 国际电信联盟《2013年衡量信息社会报告》，见：

http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf

实现这些目标的步骤包括：

- 在涉及公共ICT设施提供的主要政策和立法条款中，规定ICT无障碍获取的一般性原则；
- 在决策过程中听取残疾人的意见；
- 让残疾人和残疾人组织了解无障碍获取的公共ICT接入政策、设施和服务；
- 贯彻无障碍公共采购程序政策框架，确保为公共接入设施采购的ICT设备和服务具无障碍获取性；
- 利用普遍服务和接入基金资助辅助技术的采购和对工作人员进行技术使用方面的培训；
- 增进残疾人对无障碍公共接入设施的了解，包括利用适用标识，开展无障碍公共接入设施的宣传；
- 培训员工掌握服务残疾人客户（包括使用无障碍ICT）的方法；
- 确保残疾人可无障碍地使用公共接入设施提供的应急通信服务；
- 制定可衡量的目标，每年报告其落实情况，并酌情确保无障碍规定得到执行。

2.10 针对残疾人的转接服务的要求

20世纪60年代后期，美国三位聋人开发了使用声音耦合器在语音电话网实时传输文本信息的附加电传打字机（TTY），开启了聋人利用电话交流的时代。这种打字机后来被称为文字电话，并开发除了便携式的小型设备，省去了携带庞大、陈旧的附加电传打字机的麻烦。

美国的另一位聋人对这种文本电话通信系统进行了扩展，创建出一种转接业务，使文本电话用户可通过电话与没有文本电话的健听人进行联系。目前已通过网络提供语音文本和视频转接服务。

在发展中国家，残疾人用来进行远距离沟通交流的网络系统建设尚不统一。有必要专门针对具体的使用环境制定政策、实施计划和良好做法准则，形成针对残疾人的电信系统，并在网络和终端之间使用标准接口。

更多有关转接服务的国际标准化发展趋势的信息，请参见附件4。

2.10.1 通过电信和ICT网提供的无障碍应急服务

残疾人应能使用日常通信手段（如终端设备和服务）获取应急服务，并能使用任何技术和设备免费联络应急服务。还应通过其它无障碍获取方式，如手机的文本消息向公众提供应急信息。

向公众提供的应急信息亦应采用残疾人可无障碍获取的格式提供，如面对聋人和听觉障碍人群的手语和字幕或文字以及面对视觉障碍人群的电视/视频节目的语音信息。如

一国家确已设立负责无障碍应急通信的委员会或机构，可通过对现有规定进行定期审议（必须经过有残疾人参加的公众磋商）来实现上述目标。

使用ICT的残疾人应能通过普通应急号码联络应急服务。由于各国和各种残疾人使用的应急号码不同，提倡普遍使用“112”、“999”和/或“911”作为通用应急号码。

在自然灾害发生时，广播的公共信息和通知必须以适当的通信形式无障碍地提供给残疾人，由此使主流通信渠道得到充分利用。经许可的视频节目服务提供商必须确保这类通知和警报以所有残疾人可无障碍获取的相关形式进行广播。

立法机构、决策机构和ICT监管部门应审议其应急服务立法、政策和规定，确保将残疾人的需求考虑在内。这意味着审议包括国际电联国际公众电信编号方案（E164）²³用于话音服务的号码、短代码和其它适用号码在内的ICT服务的需求。应急呼叫中心应能收到SMS短信以及来自转接服务的呼叫并对此做出响应，从而使听力或语音障碍人群得以拨打应急呼叫。

2.10.2 促进国际电联电信和ICT无障碍获取（包括网页无障碍访问）的基于标准的商业解决方案

一些促进国际电联电信和ICT无障碍获取（包括网页无障碍访问）的基于标准的商业解决方案包括：

VerbaVoice app是经济高效的解决方案，旨在消除电视和互联网语言通信的障碍。VerbaVoice应用是听力受损者的通信辅助工具，能够将口述语言变为实时文本和/或手语视频。将VerbaVoice开发的翻译网真系统（ITS）用于现场活动和电视广播为听障、视障和行动障碍人群提供了实现全包容性的机会。

“**弗雷德在学校**”（**Sub-Ti**）是一种有创意的创新性教育项目，其主要目标是加强青年观众（中学生）的电影知识素养。这是一个全包容性项目，充分适合感官缺陷青年的需要。弗雷德在学校项目目前已施用于八个欧洲国家的中学，并可向不同国家和文化扩展并实现客户化。

实时文本（RTT）（美国）即一种基于文本的通信方式，其每个字词几乎在键入发送装置的同时出现在接收装置上，从而实现与语音同步的通信对话流。RTT以互联网协议（IP）为基础，其功能相当于TTY的后续技术，（亦使用PSTN上的实时文本）使听力和/或语言残疾者能够使用电话服务。ITU-T T. 140标准仍用于新版RTT。

全民无障碍通信（ACE）（VTC-Secure和美国FCC）是有助于解决根本性通信难题的最新免费解决方案。基于标准的软件的目的是创建开放源代码，同样能使全世界各国政府、大学、非营利组织、众包社团、甚至个人等所有群体都能为大量用户修改、改进、保护和分销软件，同时维护其互操作性。

将**HERMES**作为面向自闭症（ASD）人群的替代性和增强型数字通信手段（**阿根廷共和国**）。HERMES使用免费和开放技术。HERMES项目包括为通过CEDICA参与的自闭症（ASD）儿童和青年开发辅助和替代数字通信手段。HERMES是患者与其治疗专家和CEDICA开展的辅助疗法之间的备份通信工具。

RAICES（阿根廷共和国） – 有助于教学并激励儿童通过社交媒体获得知识。RAICES项目通过其面向儿童和青少年的非娱乐性社交网络游戏策划案提供了一个有吸引力的学习场景。

eQUINO（阿根廷共和国） – 视频游戏eQUINO是对用于残疾人的马匹辅助治疗和活动的补充，该游戏专门为教育目的而设计的。

基于规则的网站无障碍获取分析仪（阿根廷共和国） – 开发SiMor的目的是提供能够分析整个网站以验证其是否符合最重要的实体之一W3C制定的无障碍导则并将发现的错误和可能的解决方案通知开发人员的免费源码工具，目标是推进为包容性的网站创建无障碍内容的工作。

其它在相关标准基础上制定的、有助于促进ICT无障碍获取的商用方案优秀做法和所取得的成就，见**附件1**。

3 第3章 – 无障碍获取ICT用于教育

3.1 促进和实施无障碍电子教育的要求和准则

信息通信技术就其本质而言依赖于沟通能力，因此ICT的使用和读写能力之间的联系越来越紧密。很多通过ICT交付的内容（尤其是基于互联网的内容）仍是文本内容，网页的格式和内容往往要求用户具备读写能力。无障碍ICT和无障碍获取工具（AT）有助于文化水平较低的ICT用户获取服务。

除较为常用的“残疾的医学模式”（将残疾定义为“使个人活动受到限制的身体、精神或心理状态”）外，最近出现了“残疾的社会模式”，这种观点被视为促进残疾人充分融入社会的更有效或更强有力的概念框架。

在社会模式下残疾包括：(a) 有读写困难；(b) 尝试交流但不懂或不讲相关国家或当地语言，(c) 以前从未使用过手机或计算机，尝试手机或计算机，但未成功。

上述所有情况均视为残疾，因为存在上述情况的人群无法与周围环境进行交互。通过一些无障碍获取工具可改善他们对ICT的无障碍获取。

对于初级学员，有必要根据长期教育计划制定学习方案，以获取基础知识。需通过文字或语音的课本及教师学习基础知识。因此，需要编撰基础知识课本。在此方面，一些国家开展了采用课本的学习计划，因此首先调查成员国这方面的情况是有益的。

对于具备高水平交流能力的用户，他们可以获取电信网络/ICT工具。但为了获取相关工作技能，他们必须学习产品开发的高级技巧。在此情况下，重要的是学员们必须从有经验的残疾人那里学习技能。

3.2 针对有读写困难人群的无障碍获取工具

信息通信技术就其本质而言依赖于沟通能力，因此ICT的使用和读写能力之间的联系越来越强。很多通过ICT交付的内容（尤其是基于互联网的内容）仍是文本内容，网页的格式和内容往往要求用户具备读写能力。

可通过一些无障碍获取工具（AT）改善对ICT的无障碍获取，具体包括：

- 在阅读方面使用无障碍获取工具 – 通过语音呈现文本内容。可为有阅读困难的人群提供支持的无障碍获取工具有助于解码、流畅阅读和理解。
- 在书写方面使用无障碍获取工具 – 其中一些工具可帮助用户避开实际的写作任务，而另一些则帮助用户使用正确拼写、标点、语法、词语用法和语言组织。语音识别技术、读屏器和替代键盘都对在书写方面有困难的人群有所帮助。
- 购买采用通用设计原则的设备、硬件和软件 – 通用设计原则要求设计人员们评估其产品的功能需求，并尽可能减少产品功能需求超过预期用户能力的情况。目标是通过设计障碍程度最低的产品，尽可能减少环境中出现社会模式残疾的可能。

3.3 无障碍电子教育实际应用的良好做法

电子教育和基于网络的课程方便灵活，使残疾学生受益，满足其个性化需求。除了便利性，在线学习亦为残疾学生提供了一定的灵活性。

在线课程的设计越来越多地采用通用学习设计（UDL）原则。即该课程的信息通过多种方式呈现。例如在网络课程中，阅读作业已采用标准文本（如PDF文件）和音频文件（如MP3）格式。这自然为所有学生提供了阅读或收听信息、保存下来以便结合辅助学习软件使用、视需要随时进行复习以及将其转换成学习笔记的灵活性。在线课程需要更多地与媒体（需可无障碍获取）进行交互，如视觉资料、图形和带有隐藏式字幕的视频。

有关无障碍电子教育的其它优秀做法及所取得的成就，见附件1。

3.3.1 无障碍的学校计算机中心

瑞典的教育体系SPSM促使瑞典大部分城市组建了“skoldatatek”，即学校计算机中心，以确保所有教师了解如何利用信息通信技术以无障碍的形式将其教学内容传授给所有学生。显示了如何利用针对有阅读困难的学生的替代工具实现包容性。这种情况下的替代工具就是信息通信技术工具，如语音合成和拼写检查软件。请浏览：<http://www.inclusive-education-in-action.org/iea/index.php?menuid=25&reporeid=240>了解更多内容。

为解决科特迪瓦残疾儿童就学问题有必要成立专门机构，例如科特迪瓦聋哑人学校和位于约普贡的国立盲人学院（INIPA）。此外该国还在Deux Plateaux成立了私立白滩学校并在Cocody Mermoz由非政府组织建立了Fraîche Rosée学校。科特迪瓦聋哑人学校旨在教授聋哑青少年读写技能，并为促进他们融入社会提供有培训。电话运营商为该学校提供了计算机房，为学生提供IT培训。国立盲人学院（INIPA）旨在为视觉受损的青少年传授读写技能，并为促进他们融入社会提供有培训。该学校让视觉受损者进一步深造成为可能。有些学员的学业涉及多个领域。电话运营商为该学校提供了计算机房，为学生提供IT培训。教学采用开放源软件。白滩学校是阿比让Cocody Deux Plateaux的一家专门机构，专为智障青少年服务。该学校教授学员如何使用信息技术。

有关无障碍电子教育的其它优秀做法及所取得的成就，见附件1。

3.3.2 了解和设置教室计算机系统偏好 – 英国的初步自调节体系

在英国，一些学校在新学生入校的迎新周采用了初步自调节体系。使用简单的自助材料向学生们演示如何调整Windows电脑上的无障碍功能，以更方便地使用这些功能，特别是提高屏幕的可读性。这样，学生浏览“轻松使用设置中心”调查表上列出的Windows无障碍功能后就可以进行自我认定。如果Windows无障碍功能不足以满足所有学生的个性化无障碍获取需求，学生个人负责自我认定为需要辅助技术。更多信息请访问：http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/accessible_ict_personalized_learning_2012%20.pdf。

有关无障碍电子教育的其它优秀做法及所取得的成就，见附件1。

3.3.3 支持残疾学生学习的移动电话策略

此研究项目就移动电话如何使学生以最适合自己需求的方式进行学习的策略提供建议。其中涵盖读、写、做笔记、了解时间、活动策划、听、计算和使用字典以及上网。更多信息请访问：http://g3ict.org/resource_center/publications_and_reports/p/productCategory_whitepapers/subCat_9。

有关无障碍电子教育的其它优秀做法及所取得的成就，见附件1。

3.3.4 电子学习、语音和语言技术的无障碍获取技术

语音接口或语音识别是使计算机理解话语并通过电脑与人之间的顺利交谈交换信息的下一代接口。最近，语音接口已成为得到政府助力的智能机器人、远程信息处理和数字家庭等信息技术行业的基本要素之一。具备这些功能的个人计算机和智能手机已经问世。语音接口或语音识别有望与许多应用领域（如国防、医疗服务等）相结合。此外，语音识别接口是移动网络信息服务领域的核心技术，亦用于语言教学服务的会话培训。

技术识别和理解用户的语音并在有限的对话情景下产生适当的反应。核心技术确实存在，而且已在移动设备（智能手机、导航终端等）或可穿戴设备（如智能眼镜和智能手表）信息服务的自然语音识别接口中得到使用。智能电话采用这种技术，加快了移动环境中的各种信息服务，如语音搜索，语音短信；语音启动的虚拟代理等。会话语音识别处理技术已用于高质量的语言电子教育服务系统。该系统对学生的发音进行评估，引导会话，以帮助提升口语技能。韩国已对语言分析器和识别器进行优化，以适应典型的韩式英语发音。

核心技术已应用到一些商业产品。如韩国的GnB智能英语和NCsoft公司的《如何学英语》（Hoodoo English）。此外，韩国电子通信研究院（ETRI）开发了一种称为Genie Tutor的语言电子教育服务试验系统。

在残疾人用户的学习过程中，先进的语音技术可在方便用户体验方面发挥重要作用。例如，语音识别接口利用语音合成为盲人/视力低下的人群提供了方便的接口。

在日本，教育领域非常广泛。获取方式因人而异，因此必须考虑多种技能水平。掌握了网络知识的用户可通过自己的努力转到更高级的应用。

有关无障碍电子教育的其它优秀做法及所取得的成就，见附件1。

4 第4章 – 结论与总体建议

4.1 要在发展中国家面向残疾人和有特殊需求的人群实施有关电信和ICT无障碍获取的政策和监管框架需要考虑的主要问题

- 普遍服务义务应考虑到残疾人在获取ICT方面的需求；
- 普遍服务法律和监管框架应将无障碍作为普遍服务的一个明确目标包含在内，普遍服务基金也应予以考虑；
- 各级教育中，教育提供涉及的所有利益相关方都应促进无障碍信息技术的使用；
- 任何制定或修订的包含信息无障碍的一般政策或法律都应包括明确的目标及实施情况的年度报告；
- 残疾人代表及相关机构/组织参与政策制定和实施政策、立法及法规是确保成功输出成果的关键。

4.2 如何促进公共ICT场所的信息无障碍，如电信中心和公共付费电话

- ICT政策的修改和制定都应征询残疾人的意见；
- 制定政策应让ICT行业（制造商和厂商）参与；
- 政府应确保将新制定的有关ICT无障碍获取的政策和标准通知所有的利益相关方，包括ICT行业和残疾人；
- 应鼓励制造商和开发者在设计和开发技术时，咨询并纳入残疾人的需求；
- 制定或修订相关政策时，应首先考虑下列重点领域：
 - a) 受教育的机会
 - b) 获取紧急电话号码
 - c) 备灾/响应/重建系统（例如国家应急计划应包括残疾人的无障碍需要）。

4.3 如何推广可由难以掌握读写能力人群使用的无障碍电子教育的无障碍获取工具

- 促进包含无障碍的主流ICT及辅助技术的采购，用于教育及公共场所，如学校、大学、图书馆和电信中心；
- 通过代表残疾人的组织，确保用于教育和培训采购及提供无障碍ICT的任何倡议和项目都基于消费者的实际需求；

- 通过代表残疾人的组织，确保用于教育和培训采购及提供无障碍ICT的任何倡议和项目都基于消费者的实际需求；
- 确保用于教育和培训采购及提供无障碍ICT的任何倡议和项目都考虑到培训残疾人如何使用ICT；
- 创建有关自适应信息技术的研究领域将为IT培训师和不具备无障碍获取技能的官员赋能；
- 建议自适应信息技术的研究领域包含以下内容：
 - a) 对残疾人和普通人而言，此研究领域的基本工具相同。为体现残疾人IT的特殊性，可使用其它工具；
 - b) 此程序将以软件为基础，且这些软件可分为两类：普通软件和自适应软件与设备；
 - c) 自适应软件包含旨在促进残疾人自食其力的计算机软件，例如：用于内容无障碍获取的JAWS和NVDA。
- 大学是实现无障碍获取问题及相关培训主流化的重要同盟。

4.4 万维网无障碍获取的关键政策考量：

- 应与残疾人（PwD）协商制定所有政策。政策制定者/监管机构应确保按照国际电联导则以无障碍方式举办会议；
- 政府或许会考虑制定单独的万维网无障碍获取政策或更新现有政策，以便纳入万维网无障碍获取方面的考虑或将两者均考虑在内。负责制定和实施政策的政府机构可以将此纳入公共采购职责、电子政务和ICT政策和战略、残疾政策实施、反歧视、消费者保护、教育和培训；
- 万维网无障碍获取政策的一个关键方面是其所涉及的万维网范围。此范围可能首先包含政府和公共部门网站，其次为公众关注的、诸如银行、电子商务、个人医疗提供方的网站；
- 万维网无障碍获取政策应参考有关万维网无障碍获取政策国际标准、W3C、2.0版网络内容无障碍获取准则（WCAG）；
- 政府可作为万维网无障碍获取的榜样，并考虑将社交媒体作为向公众传播信息的有效工具；
- 政府应在网站公布阶段性承诺以及实现万维网无障碍获取的各个阶段。

万维网无障碍获取政策应：

- 确定如何解决与公众部门网站升级相关的费用问题。一种方式是使用普遍服务基金通过有关ICT基础设施的中央资金筹措予以实现。这对于为在线发布的政府视频提供字幕等无障碍获取功能尤其重要；

- 在考虑到新的网站版本并考虑更新现有网站的情况下纳入落实时间安排，同时制定程序以监督按照有关新内容的国际标准（WCAG 2.0）在政策范围内设立无障碍获取网站的合规性以及报告实施情况的程序；
- 推广并树立对这些政策在政府、私营和网络行业中应用的认识。

4.5 无障碍移动电话和服务领域的关键政策考量：

- 应与残疾人协商制定所有政策；
- 监管机构应考虑使用普遍服务/接入资金补贴为丧失听力且无法以正常使用电话的人群提供国内转接服务的电话运营商；
- 监管机构应确保频谱的划分考虑到移动电话和助听器之间可能的干扰。请查阅“[预测不受保护频谱对残疾人的危害](#)”；
- 监管机构应与移动电话运营商和其他利益攸关方合作开发面向残疾人的文本转接服务和手语视频转接服务；
- 监管机构应与适当的应急服务和移动电话运营商以及移动电话制造商合作，确保残疾人平等获取应急服务；
- 监管机构应与移动电话运营商和制造商联系，确保为残疾人提供价格可承受的、无障碍移动电话；
- 监管机构应与移动电话运营商联系，确保充分提供有关这些移动电话的信息，其中包括与助听器等辅助技术的兼容性信息；
- 移动电话运营商应考虑为不愿以及不可能使用语音服务的聋人用户提供数据或SMS单项功能套餐；
- ICT运营商和制造商在促进残疾人无障碍获取服务和设备的发展，推动ICT无障碍获取创新方面扮演着重要角色；
- 推动创造开放源，以推出无障碍获取应用并降低成本，将使以可承受的价格向残疾人提供此类服务成为可能。当开放源无法作为备选方案时，政府应通过谈判提供全国性的许可证。

4.6 成员在制定有关无障碍获取音像媒体内容的政策和开发服务中确定的关键问题

- 将无障碍性做为一项主流工作并使其具有包容性；
- 与所有机构/利益攸关方创建接入组和观察团队；
- 在内容提供商、电信提供商和广播机构之间建立联系；
- 与所有机构制定现实可行的短期/长期路线图；

- 创建共同资产：技术和传送；
- 考虑设立新的 workflow；
- 做出质量和数量规定；
- 打造服务品牌和质量；
- 制定良好的政策框架；
- 为将无障碍性纳入研究议程开展宣传；
- 使无障碍服务成为商业性盈利服务；
- 采用现有标准，避免市场分割；
- 设立相关培训课程。
- 音像内容是宣传和树立ICT无障碍获取认识的工具；
- 电影节是讨论残疾人权利，传播残疾人作品和资料的有趣论坛。

4.7 公共采购领域的重要考量

- 应逐步实施政策及监管，落实保证公共部门采购无障碍ICT所需的“监管基石”（例如包括但不限于政策标准、提高认识）；
- 无障碍要求应基于所有利益相关方同意的标准，包括决策者、行业及残疾人及其代表机构。学习经验（例如美国和欧盟的经验）；
- 公共采购政策、立法和监管应与有关利益相关方协商后方可更新，并将无障碍作为公共采购的一个原则；
- 公共采购政策、立法和法规中提到的无障碍要求应基于统一和公认的国际标准；
- 落实倡议，加强公共采购官员、行业及残疾人对政策及标准的认识和能力建设。

4.8 提高所有利益攸关方对无障碍政策和技术发展趋势的认识和了解，以加强宣传效果

- 应将面向残疾人的无障碍获取做为一项重要工作，由此规范其在包容性社会中的地位；
- 应努力使无障碍获取服务成为商业性可盈利服务；
- 应将无障碍性纳入所有标准，因为这是避免市场分割的首要条件；
- 无障碍性为实现社会包容性和提高所有人的能力提供了绝好的机遇；
- 建议通过表彰与奖励的方式促进ICT无障碍获取，并将其作为向公众宣传的手段。

4.9 最后的意见 – 思路

- 协作对ICT无障碍获取至关重要：所涉各方包括残疾人、政府、运营商、制造商、大学和所有相关利益攸关方：“没有残疾人的参与一切无从谈起”；
- 希望大家都能参与ICT无障碍获取，让我们的文稿中的建议变成现实；
- ICT应被视作残疾人受教育和就业的工具以及社会和经济发展和残疾人自立生活的助推器；
- 残疾是一种社会状态而非医疗状态；
- 最终用户的能力使他们能够使用可用的无障碍获取功能，这样他们便可得益于万维网无障碍获取、相关设备和应用；
- 了解残疾人市场的价值至关重要；
- 分享世界各国的成功经验将惠及残疾人；
- 各国政府应制定有关残疾人无障碍获取ICT的国家ICT无障碍获取规划并使政府网站成为无障碍访问网站；
- 将第7/1号课题的工作范围在未来研究期（2018-2021年）扩展并相应调整为“残疾人，包括因年龄致残的老人和具有特殊需求人群的信息通信技术（ICT）无障碍获取”；
- 将ICT无障碍获取用于为残疾人提供就业机会；
- 考虑将IMT-2020 (5G)²²技术用于无障碍获取ICT；
- 确保跟进并监督ICT无障碍获取政策、做法和技术方案的落实，将使各利益攸关方能为全世界的残疾人打造一个包容性的环境。

²² IMT-2020指国际电联的5G标准化工作。

Abbreviations and acronyms

Various abbreviations and acronyms are used through the document, they are provided here.

Abbreviation/acronym	Description
AD	Audio Description
ADIE	State Informatics Agency (Agence de l'Informatique de l'État) (Republic of Senegal)
AIGF	Ivorian Agency for Frequency Management (Agence Ivoirienne de Gestion des Fréquences) (Republic of Côte d'Ivoire)
ALD	Assistive Listening Device
ANATEL	Brazilian National Telecommunication Agency (Agência Nacional de Telecomunicações) (Federative Republic of Brazil)
APADEA	Argentinian Association of Parents of Autistic Children (Argentine Republic)
API	Application Programming Interface
ASD	Autistic Spectrum Disorders
AT	Accessibility Tools
BDT	Telecommunication Development Bureau
CC	Closed Caption
CEDICA	Centro de Equitación para personas con Discapacidad y Carenciadas (Argentine Republic)
CIC	Communication Intermediation Central
COP	Child online Protection
CRTC	Canadian Radio-television and Telecommunications Commission (Canada)
DCAD	Dynamic Coalition on Accessibility and Disability
DVD	Digital Video Disc
EFHOH	European Federation of Hard of Hearing
ETRI	Electronics and Telecommunications Research Institute (Republic of Korea)
FCC	Federal Communications Commission (United States of America)
FENASCOL	Federación Nacional de Sordos de Colombia (Republic of Colombia)
G3ict	Global Initiative for Inclusive ICTs
GDP	Gross Domestic Product
GHz	Gigahertz
GPS	Global Positioning System
GRA	General Regulation on Accessibility
ICT	Information and Communication Technology
IGF	Internet Governance Forum

Abbreviation/acronym	Description
IMT	International Mobile Telecommunications
INIPA	École Ivoirienne pour les Sourds and the Institut National pour la Promotion des Aveugles (Republic of Côte d'Ivoire)
IP	Internet Protocol
IPTV	Internet Protocol Television
IRG AVA	Intersector Rapporteur Group Audiovisual Media Accessibility
ITS	Interpreters Telepresence System
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
ITU-R	ITU Radiocommunication Sector
ITU-T	ITU Telecommunication Standardization Sector
JCA-AHF	Joint Coordination Activity on Accessibility and Human Factors
M2M	Machine to Machine
MIMP	Women and Vulnerable Population Ministry (Ministerio de la Mujer y Poblaciones Vulnerables) (Peru)
MinTIC	Ministerio de Tecnologías de la Información y Comunicaciones (Republic of Colombia)
MoU	Memorandum of Understanding
NGO	Non-Governmental Organization
NRA	National Regulatory Authority
PAW	Web Accessibility Point (Punto de Accesibilidad Web)
PEAT	Partnership on Employment & Accessible Technology (United States of America)
PSAP	Personal Sound Amplification Product
PSTN	Public Switched Telephone Network
PwD	Persons with Disabilities
QoS	Quality of Service
RTT	Real-Time Test
SEE	South-East Europe
SMS	Short Message Service
SSRD	Short Ranges Devices
TRS	Telecommunication Relay Service
TSAG	Telecommunication Standards Advisory Group
TTY	Teletype Writer

Abbreviation/acronym	Description
UAS	Universal Service and Access
UDL	Universal Design for Learning
UE	User Equipment
UN	United Nations
UN CRPD	United Nations Convention on the Rights of Persons with Disabilities
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USF	Universal Service Fund
VRS	Video Relay Service
W3C	World Wide Web Consortium
WCAG	Web Content Accessibility Guidelines
WFD	World Federation of the Deaf
WHO	World Health Organization
WIPO	World Intellectual Property Organisation
WP	Working Party
WSIS	World Summit on the Information Society
WTDC	World Telecommunication Development Conference

Annexes

Annex 1: Good practices and achievements in ICT Accessibility worldwide

Annex 1 presents developments and improvements in ICT accessibility worldwide. The available good practices and achievements in ICT accessibility have been divided into sections following the Model ICT Accessibility Policy Report and are presented in alphabetical order. The identified good practices could serve as a potential sources of inspiration to be shared and replicated among the countries and related stakeholders worldwide to achieve an inclusive society.

1 ICT accessibility topics

1.1 Legal policy and regulatory frameworks

Benin: As is the case in many developing countries, the Law on electronic communications and posts include a provision to promote digital access for PwD, but its implementation is low. There are social categories for which Universal digital access should be guaranteed by the State according to Law, but in order to comply, a policy must be developed and applied for access to electronic communications for PwD.

Bosnia and Herzegovina: There is a lack of legally binding provisions, lack of funds and insufficient awareness about existing accessible services and technologies. NRAs are starting to stimulate policy makers to foster international provisions in their national legislation frameworks, and the level of expertise of software services is increasing.

Brazil: The National Telecommunication Agency (ANATEL) published the General Regulation on Accessibility – GRA (Resolution nº 677/2016 – ANATEL) which defines rights and obligations for consumers and companies, respectively, gathering rules that already existed in several Resolutions as well, and aiming to promote a reasonable balance on the market, by defining lighter obligations to smaller operators. The GRA aims to remove barriers faced by PwD and to achieve an inclusive society. The new regulation enables impaired consumers to have the same treatment that other consumers receive, empowering them with new ICTs accessible functionalities and technologies.

For more information: <http://www.anatel.gov.br/institucional/>.

Brazil: Members of Telecommunication operators, Associations and ANATEL, make part of the RGA group, which guides the implementation of Resolution nº 667/2016's rules by promoting discussions on solutions and standards for PwD.

Côte d'Ivoire has about 3,400,700 people living with a disability (WHO) and ratified the Convention on the Rights of Persons with Disabilities on 10 January 2014. Côte d'Ivoire committed itself to a process of making telecommunication/ICT s accessible. Its Telecommunications/ICT policy is an inclusive one. The policy for the digital economy and the legal and institutional frameworks take account of PwD. The bodies responsible for implementing the policy are the regulator ARTCI, for asymmetric regulation, the National Universal Service Agency, for universal service aspects, the Ivorian Agency for Frequency Management (AIGF), for frequency management, and the Ministry of the Digital Economy, as regards development of policy and legislation for the Government.

Côte d'Ivoire included in its regulatory framework provisions relating to access to telecommunication/ICT services by persons with disabilities in the licence conditions of mobile telephony operators. The licence conditions of telephone operators stipulate that they are bound to comply with the international treaties and agreements signed or ratified by the State of Côte d'Ivoire regarding telecommunications/ICTs. Within the framework of universal service, ARTCI (Côte d'Ivoire's telecommunication/ICT regulatory authority) can, at the request of the ministry responsible for telecommunications/ICTs,

oblige operators with significant market power to offer end users with low incomes or specific social needs different rates or tariff options or formulas from normal commercial operating conditions.

Guinea considers the problem of ICT accessibility by drawing up a plan for the inclusion of the PwD. The education was identified as key for PwD inclusion in the society as well as taking advantage of new technologies. However, there is not yet a specific law enabling employment or access to ICT of PwD. It is envisaged that having technologies in national language will enable educational programs to be implementing for PwD efficiently and thus contribute to combating poverty and ensure inclusion of PwD. In that respect, there is a need to raise awareness about the benefit of such programmes to all levels.

Kenya: The legislative landscape has been changing over the years to respond to the challenges. The Government of Kenya through its NRA initiated the projects aimed at providing access to ICT for PwD. Regulatory licencing tools are imposed by the NRA to ensure that the requirements and interests of PwD are fully addressed. In promoting its mandate in ensuring Universal access to communication services and facilities, the NRA supported the establishment of ICT centres in learning institutions for PwD.

Mali lacks accurate statistics on the number of people with disabilities, the nature of their specific needs and the underlying causal factors. Both in urban and rural areas, PwD are without access to information and communication technologies. The relevant Ministry and the NRA take reasonable and proportionate measures, in particular in defining the public network access and interconnection conditions to enable all users to communicate freely within a framework of fair and equal competition, as well as acknowledging that access to service and equipment to accommodate the needs of PwD should be provided nationally.

Senegal marks significant progress with the aim to stop discrimination and improve the lives of PwD, and particularly regarding mobility, access to health and education services. A “Centre for Disabled People in the Workplace” (CHAT) is part of the State Informatics Agency (ADIE) with a focus on the digital divide and support social exclusion.

Mexico: The Mexican government has published the web content accessibility guidelines to be followed by public agencies and state companies. The document contains the principles and technical aspects that should be followed to ensure that the 7 per cent of Mexicans that have any type of disability have access to all information and public services. The Mexican Government’s new online portal was launched in 2015 and is committed to have all of its content accessible to PwD.

Mexico: The Federal Telecommunications Institute will publish in December 2016 the accessibility guidelines to be followed by telecommunication operators. These guidelines define accessibility aspects relating to customer service, public phones and websites. These guidelines represent an important effort from the government to promote digital inclusion in the private sector. Telecommunication operators will have to: publish contracts, tariffs and billing in digital accessible formats, produce catalogues of equipments with accessibility functionalities, accessible public phone booths, customer service with accessibility measures, accessible websites (WCAG 2.0 AA), and promote for the benefit of all users.

Republic of Korea guarantees ICT accessibility is to people with disabilities including old people to use products, systems, services and facilities regardless of their physical or technical difficulties. In achieving this, in Korea the focus is equally on government’s role to prepare legal system for ICT accessibility, standardization strategy for the ability of the society and efforts, such as providing trainings, consulting and promoting to ensure participation of other that stakeholders other than public sector.

United States of America: With the collaboration of IBM, UMass Boston and the Worcester Polytechnic Institute, this research sums up to current World Wide Web Consortium’s (W3C) work to produce accessibility standards for persons with cognitive and physical disabilities. For more information:

<http://digitalinclusionnewslog.itu.int/2016/09/19/umass-medical-school-researches-text-simplification-to-make-websites-more-accessible-for-persons-with-cognitive-disabilities/>.

United States of America: Several lawsuits have been filed in the USA against major organizations due to the lack of accessibility features on their websites. In response, the Perkins Access initiative consists on providing support for educational institutions to comply with federal digital accessibility regulations. Based on the support of a group of tech experts with different disabilities, Perkins organization generates digital assets' assessments and offers solutions for adapting institutional websites to the most recent regulatory standards.

For more information: <http://digitalinclusionnewslog.itu.int/2016/03/22/perkins-access-to-support-educational-institutions-for-complying-with-us-federal-accessibility-regulation/>.

Canada: 911 is Canada's National emergency line. Canadians who have a hearing or speech disability and who have registered can now send a text message 9-1-1 in the case of an emergency. This is done by first placing a voice call to 9-1-1 – this is to ensure operators can locate the individual making the 9-1-1 calls. The 9-1-1 operator, upon not receiving a vocal response, will check for the phone number in the database of text-to-9-1-1 users. The 9-1-1 operator will then send a text to the phone number who made the 9-1-1 call, beginning their interaction. In this way, regardless of the person's abilities, all Canadians are able to access this service that is critical for health and safety.

For more information: <http://digitalinclusionnewslog.itu.int/2016/03/03/accessible-text-to-911-service-to-support-people-with-hearing-disabilities-in-ottawa/>.

Japan: proposes two methods in regard to accessibility of services destinations in emergencies for PwD: one is directly intended to operate the mobile phone/smartphone and how to access the emergency center, while the other is cut out a part of the operation unit of the mobile phone, with a button in the vicinity of the ornaments of the body, is a method of pressing the button in the emergency situations.

1.2 Promotion of public access

Argentina: The government of San Luis province in Argentina announced its new digital inclusion campaign that will target senior members from the community. The "Algarrobo-Abuelo" campaign is part of the digital plan of San Luis 3.0 that seeks to digitalize the community's public services. It will also provide personalized support to teach seniors how to use their new devices. For example, through a sub initiative called "Nube de Plata", pensioners from the province will conform a network of retired volunteers to support teach their peers digital literacy skills.

Brazil: Receiving a telecommunication document in an accessible format from the operators became possible after the new regulation adoption. As requested by an impaired consumer, operators must send, at no costs, a copy of the contract ,service plan offer, billing document, among other documents, in Braille or other accessible format, to visually impaired people (RGA's Article 8º, I).

Canada: Maayan Ziv, a student from Ryerson University that lives with muscular dystrophy, has developed an app that shows accessible locations worldwide. This has been very well received by wheelchair users and is also an invaluable database for public authorities and other parties concerned to pinpoint areas that need improvement. So far, 93 cities and 1629 places have been pinned.

For more information: <http://digitalinclusionnewslog.itu.int/2015/12/08/mapping-app-to-pin-point-accessible-locations/>.

Colombia: The government of Colombia acquired a 4 year-term license of JAWS (screen reader) and a license for MAGIC (screen magnifier) that is available to any person in Colombia that is blind or has low vision. Training is included and the government is providing digital literary courses for the use of this software. As part of this project, technical support as well as installation in libraries, in kiosks (ViveDigital) and other locations, is provided. This program enables PwD to access to screen reader

and magnifier that would not be affordable otherwise. Moreover, this project targets a train the trainers' course for 50 persons with visual disability to ensure that this knowledge will be expanded. Creation of capabilities is a cornerstone of the program where more than 5,000 persons have been trained in the appropriation of ICT by PwD and elderly.

For more information: www.vivedigital.gov.co/convertic.

Colombia: Ayudapps is a project to develop technological solutions that respond to the needs of PwD and help them in their daily life. The project has several stages. In the first stage of the project any person could present or explain what type of barrier they encounter and what the needs are. The second stage invites developers to present their proposed solutions to address the need and eliminate the barrier. At the end the best project is selected. This initiative is led by the Ministerio de Tecnologías de la Información y Comunicaciones (MinTIC).

For more information: <https://apps.co/inscripciones/convocatoria/ayudapps-2015/>.

Colombia: MappAcc is an application that enables a person with a disability to know beforehand the level of accessibility of places, products and services. MappAcc allows a person with disability to evaluate the level of accessibility of a place. Once the user accesses MappAcc it geographically place him and will display categories (e.g., hotel, restaurant, hospital) with a checklist indicating the level of accessibility of the selected items. Such information will certainly be useful for another user. MappAcc seeks that in the long run, there may be an evaluation overtime as to whether a certain place has improved in accessibility and if so, a certification may be granted.

For more information: <http://mappaccessible.com>.

In **Japan**, the area of education is very broad. Access methods are different by the user, so many skill level must be considered. The user who acquires network literacy is possible to proceed to more advanced applications levels by their own efforts.

Kazakhstan: Development of wireless telephony has considerably improved the ability of people with disabilities to function in. Blind and visually impaired people no longer need to find a payphone, and wheelchair users no longer have to struggle with inaccessible phone kiosks. Text messaging for service subscribers has made life easier for those with impaired hearing. Also, both elderly and persons with disabilities can use simplified emergency call procedures.

Latin America: "Launching People – Mixed Talents" is a Samsung program to get Millennials engaged in generating ideas and solutions for promoting digital inclusion of children in Latin America. The overall concept consists in combining the skills of young people from multiple backgrounds, to combine their ideas with guidance from experts in the technology and education fields. For more information: <http://digitalinclusionnewslog.itu.int/2016/06/01/creative-marathon-to-promote-children-digital-inclusion-in-latin-america/>.

Peru: The Women and Vulnerable Population Ministry (MIMP) from Peru, with the support of the National Council for PwD (CONADIS) and the Centre for Prevention of Drug Abuse (Cedro) signed an agreement to provide digital and financial training for PwD. This collaboration seeks to strengthen the digital skills of PwD. Beneficiaries will receive free training related to diverse software by using accessibility tools for persons with visual and hearing impairments. For more information: <http://digitalinclusionnewslog.itu.int/2016/06/22/peruvian-women-and-vulnerable-population-ministry-to-support-digital-inclusion-for-persons-with-disabilities/>.

Republic of Korea: The core technology was applied to several commercial products such as GnP smart English and Hodoo English of NCsoft in the **Republic of Korea**. Furthermore, a pilot language e-Education service system was developed at the Electronics and Telecommunications Research Institute (ETRI) called Genie Tutor.

Sweden: The Swedish education system, SPSM has inspired a majority of Swedish municipalities to organise 'skoldatatek', i.e. School Computer Centres, to ensure that all teachers know how to use ICT in making their teaching accessible to all pupils. It shows how inclusion can be made possible by using alternative tools for pupils with reading difficulties. Alternative tools are in this case ICT tools such as speech synthesis and spell check software. See more at: <http://www.inclusive-education-in-action.org/iea/index.php?menuid=25&reporeid=240>.

United Kingdom: in the United Kingdom, some schools introduced a basic self-accommodation framework during the induction week for new pupils into the school. Using simple self-help materials, pupils were shown how to adjust accessibility features on the Windows PCs to use them more easily and specially to improve screen readability. This allows students to self-identify themselves by going through the Windows accessibility features in the "Ease of Access Centre" questionnaire. When Windows accessibility features were not enough to address all students' individual accessibility needs, it was the student's individual responsibility to self- identify as needing Assistive Technology.

http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/accessible_ict_personalized_learning_2012%20.pdf.

United States of America: According to an article published by the Huffttington Post in April 2016, coding may generate important benefits particularly for students with learning disabilities. Some of the main reasons for this are that programming skills provide these students with the opportunity to strengthen their proficiency in areas such as organization, higher order thinking, self-esteem, socialization and teamwork. Coding skills offer solutions by building confidence and empowering them. For example, the New York based organization Tech Kids Unlimited was created in 2009 to empower digital natives through the use of ICT tools. Another similar organization provides technical training to students with autism with the purpose of supporting them to fulfil their goals.

For more information: <http://digitalinclusionnewslog.itu.int/2016/05/14/programming-and-computer-science-to-better-prepare-students-with-disabilities/>.

United States of America: The United States' Department of Labour with the support of the Partnership on Employment & Accessible Technology (PEAT) launched TalentWorks, a free online resource that provides guidance for organizations to ensure that their web-based job applications and recruiting processes are accessible for PwD. Building a platform to provide accessibility guidance for employers may potentially improve hiring processes thus leading to a more diverse and inclusive workforce. Considering that most of the recruitment processes have recently moved online, this sort of initiative is necessary to promote equal opportunities to access the labour market. For more information: <http://digitalinclusionnewslog.itu.int/2016/04/22/talentworks-online-tool-to-guide-accessible-e-recruitment-practices/>.

United States of America: Bookshare is a digital platform initiated by Benetech a non-profit organization engaged in using technology to address social challenges. Under the sponsorship of the U.S. Department of Education, Office of Special Education Programs, the "Bookshare and Innovation for Education" initiative offers more than 390,000 free titles for American students who have visual impairments, physical or learning disabilities.

For more information: <http://digitalinclusionnewslog.itu.int/2016/03/09/bookshare-free-accessible-online-library-for-us-students/>.

United States of America: A team of researchers at the University of Michigan is developing a prototype for a new Kindle-style full-page Braille display that would allow users to access content on a full page at the same time, instead of reading one line at a time. The new device works through a pneumatic system instead of an electronic one, with a display made of tiny bubbles that could be filled with air or liquid to become Braille characters.

For more information: <http://digitalinclusionnewslog.itu.int/2016/01/28/new-full-page-braille-reader-under-development/>.

United States of America: Caltech, the California Institute of Technology, developed a wearable gadget named vOICe Device aimed at helping blind people experience the surrounding environment as it translates images into sound. The gadget has the shape of sunglasses and transforms the images captured by its attached camera into associated sounds via a computer algorithm.

For more information: <http://digitalinclusionnewslog.itu.int/2016/02/01/a-new-gadget-to-help-the-vision-impaired/>.

United States of America: NavCog uses Bluetooth beacons strategically placed indoors to collect the data needed and generate a topology map that will guide the app user around universities, laboratories or even at home. In simple words, this works similarly to a GPS, but for indoors. IBM Research teamed up with Carnegie Mellon University to develop NavCog and made its platform open source so developers from around the world can contribute to the project.

For more information: <http://digitalinclusionnewslog.itu.int/2015/11/18/an-indoors-navigation-system-for-the-visually-impaired/>.

1.3 Mobile communications accessibility

Argentine Republic: Argentinian company FDV Solutions is working in two digital inclusion projects called Nahual and DANE. The DANE project started in 2013 with the support of organizations such as the Argentinian Association of Parents of Autistic Children (APADEA) and the Argentinian Association for Down Syndrome. Its main objective is to create apps to promote ICT inclusion for PwD, with the support of experts in education, students and volunteers. One example is “Juguemos Todos” app, which was designed to enable persons with Down Syndrome to utilize information technologies.

For more information: <http://digitalinclusionnewslog.itu.int/2016/06/16/nahual-and-dane-projects-to-promote-digital-inclusion-in-argentina/>.

Argentina: **HERMES** as an alternative and augmentative digital communicator for people with Autistic Spectrum Disorders (ASD). The HERMES uses free and open technologies. Project HERMES consists of the development of an augmentative and alternative digital communicator for children and young people with ASD (Autistic Spectrum Disorder) who participate from CEDICA. HERMES serves as a backup tool for communication between the patient and their therapists and complements therapy carried out at CEDICA.

Argentina: The **RAICES** contributes to teaching and seeks to stimulate children to acquire knowledge through social media. RAICES Project, through its serious social online game proposal, which is meant for children and teenagers, provides an attractive learning scene.

Argentina: **eQUINO** is a video game that complements equine-assisted therapies and activities for PwD is being designed specifically with educational goals in mind.

Argentina: **Rule-Based Web Accessibility Intensive Analyzer:** the development of SiMor came about with the intention of providing a free source tool capable of analyzing entire Web sites to verify their compliance with accessibility guidelines established by one of the most important entities, W3C, and inform the developer of the mistakes found and solutions possible, with the goal of facilitating their work in creating accessible content for an inclusive Web.

Brazil: Hand Talk is a smartphone app developed to improve social interaction and facilitate independence for deaf mobile users. This app presents an animated avatar named Hugo who converts speech into sign language, acting as a personal sign language interpreter for deaf mobile users. Hand Talk won the 2015 Accessible Mobile Applications Contest, an ITU Regional Competition for the Americas, which judged creativity, development and user experience of the app.

For more information: <http://digitalinclusionnewslog.itu.int/2016/10/04/a-mobile-app-gives-deaf-people-a-sign-language-interpreter-they-can-take-anywhere/>.

Brazil: The operators must publicize accessibility features for hearing impaired (like subtitles and messages options), for visually impaired (like screen reader, audio description, beeps, scanner, text-to-speech), for motor impaired (like voice recognition, voice reply, autotext) and for cognitive impaired (like voice recognition, text prediction), according to RGA's Article 9º.

Brazil: The GRA establishes that there must be channels for accessible communication by Internet, with professional interpreters talking in Libras (the Brazilian language of hearing impaired people) to assist people with hearing impairments (RGA's Article 8º, VI).

Brazil: Fixed and Mobile Telephony companies must offer a Communication and Intermediation Central (CIC) with interpreters in Libras for persons with hearing disabilities, able to receive video calls, besides message communication. The service will be free of charge and available twenty-four hours a day (RGA's Article 14).

Mexico: Towi is a technological platform meant to develop the learning abilities of children with disabilities through videogames in a computer or tablet. The platform initially assesses the cognitive profile of the child taking into account a test of the child and a questionnaire answered by her parents. This initial assessment allows that each child has her own route based on her requirements. The platform collects different metrics as response time, number of achievements, types of errors, level of accurateness, etcetera. Such information may also be consulted by parents, teachers and other professionals. Towi platform has undergone scientific validation, which provides elements for having it as a tool for assessing children's cognitive status. Among the advantages is that the platform reduces time of testing and is automated. Towi was created by students from Universidad Panamericana within a Microsoft contest (Imagine Cup). Further support for Towi App was provided by Wayra, an entrepreneur initiative of Telefonica. Currently Towi is being assessed by a group of experts in neurological and psychiatry sciences.

For more information: <http://www.towi.com.mx>.

Mexico: In alliance with the Mobile Manufacturers Forum, the Federal Telecommunications Institute from Mexico created a website where the users can find mobile handsets with accessibility functionalities according with their needs.

For more information: <http://movilesaccesibles.ift.org.mx>.

United States of America: Apple released a new website promoting the different accessibility features embedded on some of its main products. The Apple Accessibility website shows a set of videos explaining how different devices can be used by PwD. The website is divided into five main sections targeting vision, hearing, mobility and other disabilities. It also includes a section for learning needs and inclusive education.

For more information: <http://digitalinclusionnewslog.itu.int/2016/11/15/new-website-promotes-apple-accessibility-features/>.

United States of America: Google launched in March 2016 a tool to help Android developers create more inclusive apps. The new Accessibility Scanner checks applications and suggests potential improvements to suit the needs of the users, such as enlarging touch targets, changing colours and other things. The tool is easy to use and it only requires clicking a button to search through the app and find gaps for accessibility improvements. Since the Accessibility Scanner does not require any technical skills, it is recommended for developers who may wish to check if their designs are accessible. It is also suitable for users to perform scans that will indicate the level of accessibility of the application and thus, the user may further request where necessary its access in an accessible format.

For more information: <http://digitalinclusionnewslog.itu.int/2016/04/05/new-accessibility-scanner-for-android-app-developers/>.

United States of America: Accessible Communication for Everyone (ACE) (VTC-Secure, and the FCC United States) is a free, cutting-edge solution that helps to solve fundamental communication challenges. With the aim to create an open source, the standards-based software also allows for groups all over the world, such as governments, universities, non-profit organizations, crowdsourcing communities, and even private individuals to modify, improve, secure and redistribute the software to large numbers of users, while still maintaining interoperability with each other.

1.4 Television/video programming accessibility

Brazil: Film Festival devoted to films and audio-visual contents in connection with disabilities. In 2015 the Film Festival received many films regarding autism, persons with Down syndrome and intellectual impairments. Consequently, the theme for 2015 was autonomy and the possibility of independent living. Assim Vivemos is accessible both from a physical perspective to the forum and also through audio description, closed caption. The debates during the festival, were provided with sign language interpretation. Assim Vivemos is organized by the Ministério da Cultura from Brazil with the sponsorship of *Banco do Brasil*.

For more information: www.assimvivemos.com.br.

Canada: The Broadcasting Accessibility Fund is a unique independent program approved by the Canadian Radio-television and Telecommunications Commission (CRTC) in 2012. Its main role is to “support and fund innovative projects that provide platform-neutral solutions to promote accessibility of all broadcasting content in Canada”. The Fund announced an award of \$723,500 dollars in grants to be divided between seven projects on accessibility broadcasting chosen by the Board of Directors. By investing in these initiatives, the Canadian government aimed at promoting innovative and cost-effective solutions that use technology to ensure equal content access for PwD.

For more information: <http://digitalinclusionnewslog.itu.int/2016/02/09/broadcasting-accessibility-fund-enables-inclusive-access-to-audiovisual-contents-in-canada/>.

Since 1995, the **Canadian Radio-television and Telecommunications Commission** (CRTC) has mandated some level of closed captioning. In 2007 that requirement became 100 per cent operational in English and French-language programming. In 2011 and 2012, quality standards for closed captioning in French and English programming, respectively, were put into place. Since 2001, certain amounts of described video – the narrated description of a program’s main visual elements, such as settings, costumes, and body language – has been required. As of September 2019, the amount of described video that will be available to Canadians is expected to increase significantly.

Brazil/Canada/Colombia/United States of America: There are several film festivals around the world for portraying disability culture, promoting films in the most accessible way, delivering films produced by PwD. Examples of such festivals are: Canada Calgary’s “Picture This”, Brazil, Assim Vivemos, New York’s “Sprout” festival and “Smartic” and “Inclucine” in Colombia. All of them foster the creation of content and short films by PwD.

For more information: <http://otherfilmfestival.com/>.

Colombia: “*El Movimiento*” is a non-for-profit project that produces audio-visual contents that are accessible. Persons with different types of disabilities are involved along the production process. For example, blind persons and persons with low vision participate in the verbalization of dialogues and other non-visual elements to provide also audio description. Persons with hearing disabilities are involved in filming as camerapersons and also help in translating into sign language all the audio elements of the movies.

For more information: <https://www.facebook.com/El-Movimiento-914281131998845/>.

Colombia: “*Cine para Todos*” uses an application named WhatsCine. Through the use of tablets and glasses the app allows a person with visual or hearing disability, to enjoy a movie jointly with family

and friends. This project provides audio description in Spanish, which enables persons with visual impairments to listen all the key visual elements of the movie. The movies also have subtitles in Spanish to benefit persons with a hearing disabilities. “Cine para Todos” is free in selected days and makes available staff for PwD assistance if required. This project was launched by the Ministerio TIC, Fundación Saldarriaga Concha, a non-for-profit organization, and Cine Colombia.

For more information: www.vivedigital.gov.co/cineparatodos.

Colombia: The relay centre takes advantage of several ICTs in order to provide different communication services to deaf, hard of hearing and persons with language disabilities in Colombia. Since 2001 the relay centre has evolved and currently provides: (1) relay services by means of a chat either through text or video; (2) online service of translation from and to sign language through a device with Internet connection and speakers; (3) a tool and a forum that purports to enable Colombians to appropriate ICTs both through sign language and written language; and (4) training to be a sign language interpreter. The relay center is operated by the Federación Nacional de Sordos de Colombia (FENASCOL) sponsored by the Ministerio de Tecnologías de la Información y las Comunicaciones (MinTIC). For more information: www.centroderelievo.gov.co.

Germany: VerbaVoice app, cost-effective solutions to remove barriers to spoken communication on television and the Internet. The VerbaVoice app is a communication aid for hearing impaired people, which makes spoken language accessible as live text and /or sign language video. The combined use of the Interpreters Telepresence System (ITS) developed by VerbaVoice for live events and TV broadcast poses further opportunities to provide full inclusion for people with hearing, visual or mobility impairments.

Japan developed profiles for IPTV (Internet Protocol TV) in line with ITU-T H.702 standard. This software is included in a separate “set of box” and can provide open and close captioning, change colour of captions and backgrounds, include sign language interpretation in an additional window, as well as captioning in up to three languages.

United States of America: In order to provide users with accessible Television contents, the United States’ Federal Communications Commission (FCC) adopted a series of amendments to its Closed Captioning rules for televised video programming. The document recognizes which institutions are responsible for the delivery of the captions, provides guidance for implementation and explains the accountability mechanisms.

For more information: <http://digitalinclusionnewslog.itu.int/2016/04/13/closed-captioning-improvements-to-provide-accessible-video-programming-in-us/>.

1.5 Web accessibility

Argentine Republic: The Ministry of Seniors from Buenos Aires, Argentina in collaboration with the Ministry of Smart City organized an “*Ideatón*” event with the purpose of providing seniors with digital skills. A group of seniors were in charge of guiding the working teams to enhance and evaluate the solutions. All of the teams presented their ideas to a jury and the best ones were selected to be further developed with the support of the government.

For more information: <http://digitalinclusionnewslog.itu.int/2016/10/24/algarrobo-abuelo-will-provide-access-to-digital-technologies-for-seniors-in-san-luis-argentina/> and <http://digitalinclusionnewslog.itu.int/2016/06/23/argentinas-ideaton-to-promote-accessible-design-for-enabling-seniors-to-go-digital/>.

Argentine Republic, Uruguay, United States of America and Mexico: Web accessibility is impossible to achieve if developers and content creators do not know how to implement the web content accessibility standards. Universities and organizations in Argentina, Uruguay and the United States of America are offering training in web accessibility related issues.

Brazil: The Brazilian Web Accessibility Recognition Program, Todos@Web, seeks to increase awareness of the need of PwD to access websites by encouraging website developers and by granting awards to individuals and enterprises. There are three categories for awards under this program, namely, (i) for individuals/enterprises that implement actions to promote web accessibility, (ii) for web projects that follow W3C standards and are creative and usable, and (iii) for apps and assistive technologies developed for non-profit and with open code. This project is led by the Brazilian Comitê Gestor da Internet in partnership with W3C Brazil and other Government entities. For more information: <http://www.ceweb.br>.

Brazil: The RGA's article 8º requires that all information provided by the operators in their websites, as well as in any other communication channel, must be in an accessible format, showing functionalities like text-to-speech, large print, apps for translation, among others. ANATEL requested operators to use World Wide Web Consortium (W3C)'s standard for accessibility on web site.

Chile: The Chilean government presented in March 2015 the "Technical Norm about State Systems and Web Sites." The main objective of this regulation is to standardize the creation of accessible systems and web pages that allow PwD to equally interact with public services. It also requires government web sites to be designed and developed to guarantee full accessibility.

For more information: <http://digitalinclusionnewslog.itu.int/2016/03/10/web-accessibility-ruling-for-government-institutions-in-chile/>.

Colombia: The government of Colombia has been training web developers in Web Content Accessibility Guidelines and is revising the accessibility of more than 500 websites.

Costa Rica is one of the first countries to be trained by ITU-D on how to develop web accessibility policies and accessible websites, within a capacity building model that also includes creation of a specific fund for promoting the appropriation of ICTs by persons with disabilities. Beside, policy makers also participated at the training to ensure that Costa Rica government websites are accessible for ALL, including persons with disabilities.

Ecuador: The Ecuadorian government together with the Universidad Politécnica Salesiana developed an accessibility analyzer an online free tool that helps to identify accessibility problems in websites according to the Web Content Accessibility Guidelines.

For more information: <http://observatorioweb.ups.edu.ec/oaw/index.jsf>.

Mexico: In November 2015, at the "Accessible Americas II: Information and Communication for ALL" event in Medellin, the International Telecommunication Union (ITU) provided regional leaders with training on web accessibility policies. The workshop encouraged eliminating the barriers faced by PwD when accessing webpages. The policy framework suggested by ITU is to support governments in developing accessible digital platforms to provide equal services for PwD. Recommendations include: follow international web accessibility standards; Identify and evaluating government websites and train web designers and encouraging private entities to elaborate accessible content. To encourage such developments Telefonica Mexico and start up accelerator Wayra have partnered with HearColors to teach Mexican developers how to create accessible web content.

Latest Mexican developments: <http://digitalinclusionnewslog.itu.int/2015/12/15/latest-mexican-developments-on-accessibility-and-icts/>.

Mexico: Web accessibility points (Puntos de Accesibilidad Web, PAW) is a project that creates laboratories in universities whereby students are first introduced to digital inclusion. Then students are trained with a special methodology so that they are able to perform website assessments pursuant to W3C accessibility standards. The first laboratory was opened at the Instituto Tecnológico Autónomo de México in November 2015, the second opened at the UNAM in November 2016, the biggest public university in Mexico. This project has been created and is being implemented by HearColors, which is an entity who aims to promote accessible websites through different actions and projects.

For more information: www.hearcolors.com.mx.

Spain is one of the most outstanding countries in Europe in terms of accessibility of public sector portals and websites. In order to ensure that all its citizens, regardless of disability or age, enjoy full access to e-services provided by the public administration, Spain over the last few years, by implementing laws and standards and through appropriate policy follow-up and evaluation measures, has created the right scenario for promoting the use of ICTs based on the principles of accessibility, non-discrimination, usability and “design for all”.

United States of America: Real-time text (RTT) is a text-based mode of communication about where each text character appears on the receiving device at roughly the same time it is typed on the sending device character by character, allowing for a conversational flow of communication, simultaneously with voice. RTT is the Internet Protocol (IP)-based, functionally equivalent successor to TTY technology, (which also used real-time text over the PSTN) that makes telephone service accessible to individuals with hearing and/or speech disabilities. ITU-T standard T. 140 is still being used for the new version of RTT.

United States of America: During the last International Technology and Persons with Disability Conference in 2016, different companies presented their solutions for targeting the needs of PwD. Some of the new products that were presented included the Orbit Reader, which is a note taker with an eight-dot display where users can type. Other options were BrailleNote Touch by HumanWare that provides a touchscreen that determines where the user’s fingers are on the screen and figures out the dot combination the user inputs.

United States of America: Web Accessibility Toolkit for Research Libraries project aims at helping research libraries achieving digital accessibility by connecting research libraries with tools, peoples and examples. The project commits to making digital resources usable and accessible in research libraries. The toolkit provides explanation of standards, best practices, principles, as well as a step-by-step process to making an institution accessible. The toolkit was developed by a program of the Library of Congress in partnership with the Institute of Museum and Library Services. (www.accessibility.arl.org).

United States of America: The Social Media Accessibility Policy Toolkit intends to help government agencies evaluate the accessibility of their social media programs, identifying areas for improvement, and provides an environment to share ideas and recommendations. This toolkit is a joint effort by US government agencies, which is enriched by collaborators and users both from public and private sector that share best practices for social media accessibility for public service. The toolkit provides reference to main social media, tips, examples and best practices. The toolkit is a living document, which enables it to be easily updated.

For more information: <https://www.digitalgov.gov/resources/improving-the-accessibility-of-social-media-in-government/>.

United States of America: Facebook uses artificial intelligence to address the needs of PwD. Facebook’s automatic alternative text (Alt text) or image descriptions are generated with object recognition technology that determines the main objects that appear in a picture. This list is read to the users when they watch images on their newsfeeds: “Image may contain people, smiling, outdoors”.

For more information: <http://digitalinclusionnewslog.itu.int/2016/04/19/facebook-uses-artificial-intelligence-to-address-the-needs-of-persons-with-vision-disabilities/>.

United States of America: According to Twitter’s blogpost from March 29, 2016, a new accessibility feature has been added to the application in order to “empower customers and publishers to make images on Twitter accessible to the widest possible audience.” This new functionality allows users to add descriptive information or alternative text (alt text) to the images they tweet so that it can be picked up by mobile assistive technologies that support persons with vision disabilities.

For more information: <http://digitalinclusionnewslog.itu.int/2016/04/18/new-feature-in-twitter-for-persons-with-vision-disabilities/>.

1.6 Accessible ICT public procurement

Brazil and Mexico: The Mexican Public Function Ministry, in charge of all the procurement policies, has signed a Memorandum of Understanding (MoU) with G3ict to incorporate accessibility obligations in the government procurement policies. Brazil, specifically the Sao Paulo Government, has also been working closely with this organization.

1.7 Other ICT accessibility projects

Argentina developed a digital library Tiflolibros (one of four digital libraries in the world as stated by the UN) for people with visual impairment through cellular devices. Tiflolibros ensures access only for users with a visual impairment. Tiflolibros users can access the database of books and obtain the desired titles and then listen to them on their mobile phones.

Brazil: ANATEL will disclose a comparative classification of the operators, according to their actions for promoting accessibility. A performance index will be created by ANATEL aiming to improve telecommunication services for PwD (RGA's Art. 32).

Colombia: Ayudas para Todos is an accessible assistive technology provided by a non-for-profit organization, which is committed towards providing accessible assistive technologies for different types of disabilities, at a very low cost. This project identifies a need of a person with disability and provides an alternative solution to commercially available technologies, using ordinary and low cost materials. It also delivers training to schools, communities and interested groups to demonstrate how assistive technologies may be created by anyone and at a very low cost and may provide the needed usable device to the PwD. "Ayudas para Todos" website shares for free over 10,000 resources meant to enable PwD perform their activities without barriers. It also shows how to access and use open source software. This project has received support from public institutions and operators. For more information: www.ayudasparatodos.org.

Côte d'Ivoire: Schooling for children with disabilities in Côte d'Ivoire has made it necessary to set up specialized institutions such as the *École Ivoirienne pour les Sourds* and the *Institut National pour la Promotion des Aveugles (INIPA)*, located in the commune of Yopougon, along with the private establishments *Plage Blanche* in Deux Plateaux and the NGO *Fraîche Rosée* in Cocody Mermoz. The mission of the *École Ivoirienne pour les Sourds* is to teach deaf children and young people to read and write and provide them with training conducive to facilitating their social integration. The school has a computer room provided by a telephone operator and the pupils receive IT training. The mission of the *Institut National pour la Promotion des Aveugles (INIPA)* is to teach the visually impaired to read and write and provide them with training conducive to facilitating their social integration. The school has made it possible for visually impaired people to pursue advanced studies. Some study in all areas of activity. The school has a computer room provided by a telephone operator and the pupils receive IT training. Open source software is used. *Page Blanche* is a specialized institution in Cocody Deux Plateaux, Abidjan, which takes in children and young people with intellectual disabilities. The school introduces the children to the use of IT.

United Kingdom: "FRED AT SCHOOL" (Sub-Ti) is a creative and innovative educational project whose primary goal is to enhance film literacy among young audiences (secondary school students). It is a completely inclusive project, which fully caters for the needs of young persons with sensory impairments. FRED at school is currently implemented in secondary schools in eight European countries and can be extended and customised to different countries and cultures.

United States of America: Through ICanConnect.org persons with certain disabilities and low income can acquire assistive technology.

United States of America: Cooperative Understanding promotes the cross-combination of ideas, cultures, backgrounds, and perspectives, while empowering employees of all different abilities to achieve meaningful success. It brings about a strengths-minded corporate culture that appreciates and values all employees for what they contribute to the team, without scrutinizing how they perform their work. Achieving “Harmony at Work” through “Cooperative Understanding” is conducive to diversity, inclusion, productivity, and innovation as it focuses on what works well and continuously builds on those successes to make all aspects of the organization work even better for everyone.

For more information: <http://www.helixopp.com/cooperative-understanding.html>.

Annex 2: Resources and tools

Available resources and tools for ensuring promotion and implementation of telecommunications and ICT accessibility policies, strategies and guidelines:

- Model ICT Accessibility Policy Report – (Arabic, Chinese, English, French, Russian, Spanish, e-book version) – Accessibility of PDF report checked and edited by BarrierBreak.
- Making mobile phones and services accessible.
- Making TV Accessible.
- Online training for Public Procurement Products and Services (available through ITU Academy) <https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Pages/Events/2015/OnlineTraining/OnlinetrainingonPublicProcurementofaccessibleICTproductsandservices.aspx>.
- On-line training course on Audio-Visual Media accessibility (available through ITU Academy) <https://academy.itu.int/index.php?lang=en>.
- G3ict: e-Accessibility Policy Toolkit for PwD <http://www.e-accessibilitytoolkit.org/>.

Additional sources on accessibility for enabling an inclusive society

a) Accessibility Resolutions

- 1) ITU Plenipotentiary Conference Resolution 175 (Rev. Busan, 2014).
- 2) ITU Plenipotentiary Conference Resolution 144 (Rev. Busan, 2014).
- 3) ITU-T WTSR Resolution 70 (Rev. Hammamet, 2016) –Telecommunication/information and communication technology accessibility for PwD.
- 4) ITU-D WTDC Resolution 58 (Rev. Dubai, 2014) – Telecommunication/information and communication technology accessibility for persons with disabilities, including persons with age-related disabilities.
- 5) ITU-R Resolution 67 Geneva 2015 of RA, Recommendation ITU-R M.1076 - Wireless communication systems for persons with impaired hearing.

b) Accessibility terms and definitions

- 1) ITU-T F.791: Accessibility terms and definitions.

c) Guidelines

- 1) Accessibility guidelines
 - ITU-T Recommendation F.790: Telecommunications accessibility guidelines for older persons and PwD.
- 2) Guidelines for supporting remote participation in meetings for all - technical paper ITU-T 2015 – FSTP-ACC-RemPart – Guidelines for supporting remote participation in meetings for all.
- 3) Guidelines for accessible meetings – technical paper
 - ITU-T 2015 – FSTP-AM – Guidelines for accessible meetings.
- 4) Accessibility check List-technical paper
 - ITU-T 2006 – FSTP-TACL – Telecommunications Accessibility Checklist (Guide for addressing accessibility in standards).
- 5) Accessibility profiles for IPTV systems recommendations
 - ITU-T H.702: Accessibility profiles for IPTV systems.

d) Useful links

- 1) ITU Useful links: <http://www.itu.int/en/action/accessibility/Pages/hlmd2013.aspx>.
- 2) ITU-D: <http://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Pages/Persons-with-Disabilities.aspx>.
- 3) ITU-T: <http://www.itu.int/en/ITU-T/accessibility/Pages/default.aspx> and <http://www.itu.int/en/ITU-T/studygroups/2017-2020/16/Pages/default.aspx>.
- 4) ITU-R: <https://www.itu.int/net/ITU-R/index.asp?category=information&mlink=disabilities-divide&lang=en>.
- 5) ITU-T Recommendation V.18: Operational and interworking requirements for DCEs operating in the text telephone mode.
- 6) ITU-R Resolution 67: Telecommunication/ICT accessibility for PwD and persons with specific needs.
- 7) ITU-T Recommendation F.790: Telecommunications accessibility guidelines for older persons and PwD.
- 8) Resolution ITU-R 9-5: Liaison and collaboration with other relevant organizations, in particular, ISO and IEC.
- 9) ITU-R Question 254/5: Operation of short-range radiocommunication public access system supporting hearing aid systems.
- 10) ITU-T Recommendation F.703: Multimedia conversational services.
- 11) Technical Paper ITU-T FSTP.ACC-RemPart “Guidelines for supporting remote participation in meetings for all”.
- 12) Third Party Captioning and Copyright: https://www.google.ba/search?q=Third+Party+Captioning+and+Copyright+white+paper&ie=utf-8&oe=utf-8&client=firefox-b&gws_rd=cr&ei=ikmkV-eHFcGtaeCukMAI.

Annex 3: Accessibility related to other ITU groups and ITU-D cooperation with other organisations

ITU Council Working Groups – During the Council Working Groups accessibility was recognized and included in the Group on Child online Protection (COP), and the WSIS Forum 2015. For Child Online Protection, the Council Resolution 1316 was changed to include children with disabilities. Study group Q7/1 “Access to telecommunication/ICT services by PwD and with specific needs” closely coordinates its activities with Study group Q4/2 “Human factors related issues for improvement of the quality of life through international telecommunications”, Study group Q1/12 “ SG 12 work programme and QoS/QoE coordination in the ITU”, Study group Q26/16 Accessibility to Multimedia systems and services, as well as with JCA-AHF.

Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF) – The JCA-AHF coordinates the accessibility work in all the sectors, ITU-T, ITU-R and ITU-D, advises the ITU Secretariat, establishes and maintains contacts outside group including the UN, other UN agencies, other standards bodies, SDOs and NGO’s regarding accessibility work to assist, educate raise awareness and prevent duplication of work. It operates under the ITU-T Telecommunication Standards Advisory Group (TSAG).

Cooperation with other organizations

World Federation of the Deaf (WFD) – It discusses the needs of people who are deaf on a global basis and specifically sign language, deaf and deaf-blind education, deaf teachers and deaf interpretation of children books and remote captioning in the classroom.

European Disability Forum – an umbrella for European disability NGOs, plays a crucial role in accessibility policy advocacy. In its work, the Forum applies a “*twin track*” approach which refers to having to work both on disability-specific legislation and regulation as well as with mainstreaming accessibility. Advocacy is also underway for the Sustainable Development Goals that will be on the agenda until 2030 with the aim to have a disability into those goals.

European Federation of Hard of Hearing (EFHOH) – It is a non-profit European non-governmental organization consisting of/for hard of hearing and late deafened people, parent organizations and professional organizations at a European level in dialogue with the European Union, the Members of the European Parliament, and other European authorities.

European Commission – Horizon 2020 – a work programme for the years 2016-2017 in the area of information and communication technologies concerning accessibility, development and advancement of accessibility solutions specifically for Converging Media and Content. It may include technologies for captioning, sign language, and descriptive language, an automatic graph representation of characters, automatic translation, and adaptation, and personalized setup in an accessibility scenario.

The Global Initiative for Inclusive ICTs (G3ict) – an active member of ITU-D and ITU-T submitted a whitepaper to WIPO on the reasons that the third party is captioning had the same validity for the deaf community as the WIPO Marrakesh Treaty did for the blind community re the ability to listen to books and publications without violating copyrights.

Dynamic Coalition on Accessibility and Disability (DCAD) and **Internet Governance Forum (IGF)** –DCAD facilitates interaction and ensures that ICT accessibility is included in the key debates around Internet Governance to build a future where all sectors of the global community have equal access to the Information Society.

World Health Organization (WHO)’s ‘Make Listening Safe’ initiative is one of the activities of the WHO initiative is to get the manufacturers of these devices on board to create good listening practices and have a common vision for the promotion of safe listening habits amongst users. ITU-T Q.26/16 (Accessibility to Multimedia systems and services), has partnered with WHO to create new standards that might help reduce the threat of hearing loss.

Global Initiative for Inclusive Information and Communications Technologies (G3ICT) to ITU-R Working Party 5D (WP 5D) (IMT System) – In the area of accessibility it raises awareness that certain spectrums can become overloaded especially those that are Short Range Devices (SRDs) and that can subsequently cause malfunctions by interference and even stop working due to blockage to their use, which can cause hardship to PwD who use Assistive Listening Devices (ALDs).

Annex 4: Technology trends of relay services, international standardization trends in line with ITU-T

When performing communication service between transmission and reception through the network, to ensure interoperability between them, there is a need for a consistent the common interface. International standardization could make it possible to connect the different manufacturers' equipment and services as well as eventually making it possible for international relay services.

ITU-T Study Group 16 is the Lead Study Group on Accessibility and Multimedia Systems and Applications, is responsible for work on Accessibility standardization for PWDs. There are two types of processes for writing accessible standardization. One is creating accessibility standards that stand alone for the sole purpose of accessibility, and the other is writing standards that mainstream Accessibility Features into all standards that need to have access created for Persons for persons with disabilities

In Q26/16 "Accessibility to Multimedia Systems and Services", continues ITU-T's international in standardization work on accessibility which was originally pioneered in the 1990s in CCITT SG17 with the first Accessibility standard called ITU-T V.18. This Recommendation f harmonizes the various protocols of different the text phones to allow back to back communication in previously incompatible textphones thus providing the possibility of international communication if V.18 was placed in the gateways to give transparently to the user interoperability. Sadly, service providers did not implement this standard except Great Britain in its Relay Service Platform

Since 2000, SG16 g has been working with multimedia and to have standardization include accessibility features. The role of the ITU-T SG16 Q26/16 (Accessibility to Multimedia systems and services) has continued to the present day to expand the work on accessibility based on a "multi-media systems and services". Also, through the JCA-AHF (Joint Coordination Activity on Accessibility and Human Factors) which establishes cooperation in all standardization work all other Study Groups in the ITU-T but also with the Study Groups, of ITU-D and ITU-R., JCA-AHF also has the mandate to work with outside groups like, ISO / IEC JTC1, CENLEC, ETSI, and other UN Agencies and various disability organizations.

Challenge for the relay services

- 1) In the relay service, from being relayed by a person or a machine in the network, ensuring the transparency of information is important. The service provider, rather than being considered a third party for relay service call, it is necessary that the transmission pipe.
- 2) In the Business Operators and Interpreters, a guarantee of confidentiality of the call, preventing leakage of personal information, it is important.
- 3) The introduction of the IP access to the relay service, consideration should be given to the pre-registration system from the fact that easy to induce the unauthorized use.
- 4) Sign language interpreters to ensure the quality, the need for training, to cope with the increase of traffic, consideration of a system that the sign language interpreter can be secured 24 hours (for example the avatar, the introduction of the anime). At the time of introduction in France, there is a case where there was the use of the 30,000 call in the business time zone. Sign language interpreters to ensure the quality, the need for training, to cope with the increase of traffic, consideration of a system that the sign language interpreter can be secured 24 hours (for example the avatar, the introduction of the anime). At the time of introduction in France, there is a case where there was the use of the 30,000 call in the business time zone. This issue will be solved by "Sign Language CG" developed by the NHK Broadcasting Technology Research Institute. In this technology, one word is taken with the actual sign language movement (motion capture) converted into computer graphics (CG) is. Currently about 7,000 words are created and. 90% of sign language were comprehensible at evaluation test. Furthermore, as an extension of Recommendation F. 703, future direction was indicated in textual in the network, dialogue system between different sign languages that media exchanges (voice, sign language, Braille, etc.) are performed on terminals for transmission and reception.

5) For the introduction of video relay services, following points are necessary.

- Ensure the band at the time of broadband services;
- Ensure interoperability of devices;
- Terminal is valid signal for a particular call;
- It is possible to specify a particular type of relay service.

As a necessary technology of video relay services for deaf, touch screen, text function, visual alarm function, high-quality video display function are required.

6) On the introduction of the video relay service

- Lack of upstream band at the time of broadband services;
- Interoperability of the device;
- Terminal is useful signal for a particular call;
- It is possible to specify a particular type of relay service;
- Touch screen, text function as a technology necessary for the video relay service of deaf, visual alarm, high-quality video, etc.

7) Other

- Relay service to call the operator without special prefix of emergency;
- Funding for accessibility services development for the deaf;
- Relay services SMS and Instant Messaging technology during the system delay, but also including QoS related the performance evaluation or the like.

The relay system such as TRS and VRS used to communicate with PwDs are currently studied regarding standardization in ITU-T SG16.

With regards to voice communication, video communication, facsimile communication, in the telecommunications digital transmission system, **Japan** is aiming at achieving a high-speed, high-quality communication by redundancy compression coding and low error rate of the information signal. Meanwhile, the conversion of the information media in the ICT accessibility is transmitted by converting the semantic content of the information itself. Currently, the conversation between those with hearing disabilities it is carried out at a relay service by text or video through the interpreter in the middle of the communication link (TRS/VRS). Therefore, by converting the sign language operation to the audio or text (or vice versa), it is necessary to match the receiving function of the communication partner. Such relays services and mechanisms have already been implemented as separate systems in some countries beside Japan.

In regard to accessibility of services destinations in emergencies for PwD, **Japan** proposes two methods: one is directly intended to operate the mobile phone/smartphone and how to access the emergency center, while the other is cut out a part of the operation unit of the mobile phone, with a button in the vicinity of the ornaments of the body, is a method of pressing the button in the emergency situations.

Annex 5: List of contributions received for consideration by Question 7/1 during the 2014-2017 study period

These are the contributions received for consideration by Question 7/1.

Question 7/1 contributions for Rapporteur Group and Study Group meetings

Web	Received	Source	Title
1/469	2017-03-17	Japan	Proposal on the Question for access to telecommunication/ICT services for ageing persons
1/443	2017-01-16	Rapporteurs for Question 7/1	Report of the Rapporteur Group meeting on Question 7/1, Geneva, 16 January 2017
1/430	2017-02-14	Côte d'Ivoire (Republic of)	Provisions relating to access to telecommunication/ICT services by persons with disabilities in the licence conditions of mobile telephony operators in Côte d'Ivoire
1/422	2017-02-14	BDT Focal Point for Question 7/1	Report on BDT Activities since the last Rapporteurs Group on Q7/1 meeting
1/418 [OR]	2017-02-10	Rapporteur for Question 7/1	Final Report for Question 7/1
1/401	2017-01-31	Spain	Accessibility: A reality in Spain's e-Administration
1/397 Ann.1	2017-01-31	Centre for Internet and Society (CIS) (India)	Accessible ICTs for persons with disabilities: Addressing preparedness
RGQ/305	2016-12-08	Senegal (Republic of)	Accès des personnes handicapées et des personnes ayant des besoins particuliers aux services de télécommunication/TIC
RGQ/304 Ann.1	2016-12-08	BDT Focal Point for Question 7/1	Good practices and achievements in ICT Accessibility in the Americas Region (Guidelines and Recommendations)
RGQ/293	2016-11-25	Japan	Refinement for the draft final Report of Q7/1 on accessibility
RGQ/289	2016-11-24	Côte d'Ivoire (Republic of)	Using telecommunications/ICTs to provide autonomy to persons with disabilities in Côte d'Ivoire
RGQ/285	2016-11-24	BDT Focal Point for Question Q7/1	Report on BDT activities since the last Question 7/1 meeting
RGQ/271 [OR]	2016-11-14	Rapporteur for Question 7/1	Draft Final Report for Question 7/1
1/369	2016-09-07	Korea (Republic of)	ICT Accessibility for people with disabilities in Korea
1/367	2016-09-07	Universidad Nacional de La Plata (Argentine Republic)	Project HERMES: An alternative and augmentative digital communicator for people with ASD (Autistic Spectrum Disorders)

Web	Received	Source	Title
1/366	2016-09-07	Universidad Nacional de La Plata (Argentine Republic)	eQUINO: a Videogame that complements equine-Assisted therapies and activities for persons with disabilities
1/338	2016-08-05	Mexico	Intercambio de información sobre indicadores relativos al acceso de las personas con discapacidad a los servicios de telecomunicaciones y TIC
1/335	2016-08-05	Brazil (Federative Republic of)	General Regulation on Accessibility Rights of Telecom Services
1/328	2016-08-05	G3ict	Addition to the Question 7 report section Cooperation with other organizations under Third Party Captions, and Copyright
1/326	2016-08-05	Côte d'Ivoire (Republic of)	Accès des personnes en situation de handicap aux télécommunication/TIC en Côte d'Ivoire
1/315	2016-08-05	Japan	Requirements at the time of emergency
1/314	2016-08-05	Japan	Requirements for the persons with disabilities in the International Telecommunication system
1/299	2016-08-04	BDT Focal Point for Question 7/1	Report on BDT activities, event and meetings in area of ICT accessibility
1/272	2016-07-22	Guinea (Republic of)	Methodological approach for rehabilitating disabled people through information and communication technologies (ICTs): the case of Guinea
1/269	2016-07-20	Kenya (Republic of)	ICTs for persons with disabilities initiatives in Kenya
1/261 [OR]	2016-07-08	Rapporteurs for Question 7/1	Draft Report of Question 7/1
1/247	2016-04-04	Rapporteurs for Question 7/1	Report of the Rapporteur Group meeting on Question 7/1, Geneva, 4 April 2016
RGQ/184	2016-03-07	Universidad Nacional de la Plata	eQUINO: a Videogame that complements equine-Assisted therapies and activities for persons with disabilities
RGQ/183	2016-03-07	Universidad Nacional de la Plata	RAICES: a serious game to give new value to native cultures in Argentina
RGQ/174	2016-03-04	Universidad Nacional de La Plata	Project HERMES: An alternative and augmentative digital communicator for people with ASD (Autistic Spectrum Disorders)
RGQ/173	2016-03-04	Universidad Nacional de La Plata	Rule-Based Web Accessibility Intensive Analyzer
RGQ/150	2016-02-16	Telecommunication Development Bureau	Making ICTs and mobile phones accessible for PWD
RGQ/144 +Ann.1	2016-02-16	BDT Focal Point for Question 7/1	Television/video programming accessibility policy framework

Web	Received	Source	Title
RGQ/143 +Ann.1	2016-02-16	BDT Focal Point for Question 7/1	Web accessibility policy framework
RGQ/142	2016-02-16	Mali (Republic of)	Access to ICTs by persons with disabilities
RGQ/140 +Ann.1	2016-02-15	BDT Focal Point for Question 7/1	Accessible mobile phones and service
RGQ/135	2016-02-05	BDT Focal Point for Question 7/1	Report on BDT activities, event and meetings in area of ICT accessibility
RGQ/132	2016-01-29	Senegal (Republic of)	Access to telecommunication/ICT services by persons with disabilities and persons with specific needs
RGQ/131 +Ann.1	2016-01-21	Mali (Republic of)	Access to ITCs for persons with disabilities
RGQ/123	2015-09-11	Mexico	Actions to benefit telecommunication service users in Mexico
1/226 +Ann.1	2015-09-02	AT&T	Accessible Communications and Real-Time Text (RTT)
1/222 +Ann.1	2015-09-01	Japan	Proposal for ensuring interoperability for Accessibility
1/205	2015-08-26	Intel Corporation	ICT in education for persons with disabilities and with specific needs
1/204	2015-08-25	Korea (Republic of)	ITU-T and Other SDO's Standardization Activities on e-Learning, Speech and Language Technologies Related with Accessibility
1/185 +Ann.1-2	2015-08-10	BDT Focal Point for Question 7/1	Fred at school
1/184 +Ann.1	2015-08-07	BDT Focal Point for Question 7/1	Broadcast and beyond: Live access services anywhere, through HbbTV and LiveCap Glasses
1/180 +Ann.1	2015-07-24	G3ict	Contribution of G3ict - The Global Initiative for Inclusive Information and Communications Technologies to the Working Party 5D (WP 5D) – IMT System
1/179	2015-08-03	United States of America	ICTs, Employment, and Persons with Disabilities
1/178	2015-08-03	United States of America	USA National Deaf-Blind Equipment Distribution Program
1/173	2015-07-31	BDT Focal Point for Question 7/1	Advancing communication technology for those with disabilities
1/152	2015-07-29	BDT Focal Point on Question 7/1	BDT Report to the Study Group 1 Question 7 "Access to telecommunication/ICT services by persons with disabilities and with specific needs"

Web	Received	Source	Title
1/143	2015-07-24	G3ict	Evolution of accessibility features available on mobile devices as presented at the M-Enabling Summit 2015 in Washington, DC
1/135	2015-07-20	Bosnia and Herzegovina	Information on the Expert Group Meeting on the “Accessible TV in Converged ICT Ecosystem: Emerging trends, challenges and opportunities”
1/119 +Ann.1	2015-06-23	G3ict	G3ict third party captioning and copyright
1/118 +Ann.1	2015-06-23	G3ict	DCAD Accessibility Guidelines 2014, accessibility and disability in IGF meetings
1/117	2015-07-13	G3ict	Protection in Spectrum Management for Assistive Listening Devices (ALDs) for persons with disabilities and medical Short Range Devices (SRDs)
1/107	2015-05-07	Rapporteurs for Question 7/1	Report of the Rapporteur Group Meeting on Question 7/1, Geneva, 13 April 2015
1/94	2015-04-09	Japan	Education accessibility
RGQ/108	2015-04-01	Intel Corporation	Reflection of “ICT in education” chapters in the reports
RGQ/103 +Ann.1	2015-03-31	G3ICT	G3ict third party captioning and copyright
RGQ/102 +Ann.1	2015-03-31	G3ICT	DCAD Accessibility Guidelines 2014, accessibility and disability in IGF meetings
RGQ/101	2015-03-31	G3ICT	Protection in Spectrum Management for Assistive Listening Devices (ALDs) for persons with disabilities and medical Short Range Devices (SRDs)
RGQ/96	2015-03-30	BDT Focal Point for Question 7/1	ICT accessibility regulations in Mexico’s telecom reform
RGQ/91	2015-03-25	Korea (Republic of)	Accessibility aspects of language education based on speech/NLP (Natural Language Processing) technology
RGQ/54 +Ann.1	2015-02-26	BDT Focal Point for Question 7/1	Overview (Part 3) – Public procurement, including commercial best practices
RGQ/53 +Ann.1-2	2015-02-26	BDT Focal Point for Question 7/1	Overview (Part 2) – Which accessibility tools can be used for people with difficulties mastering reading and writing; and Practical applications for accessible e-education
RGQ/52 +Ann.1	2015-02-26	BDT Focal Point for Question 7/1	Overview (Part 1) – Necessary changes to existing legislation to promote ICT accessibility, and how to promote accessibility in public ICT spaces, such as telecentres and public pay phones
RGQ/47	2015-02-26	Bosnia and Herzegovina	Challenges in achieving ICT accessibility policy for persons with disabilities and specific needs in Bosnia and Herzegovina

Web	Received	Source	Title
RGQ/25	2015-02-05	BDT Focal Point for Question 7/1	Report on meetings, events and activities on ICT Accessibility for PWD since last Study Group meeting on Question 7/1 held in September 2014, including future activities planned
RGQ/24	2015-02-05	Mali (Republic of)	Revised draft work plan for Question 7/1
RGQ/13	2014-12-15	Rapporteurs for Question 7/1	Draft work plan for Question 7/1
1/24 +Ann.1	2014-07-24	BDT Focal Point for Question 7/1	BDT Report on accessibility activities

Liaison Statements

Web	Received	Source	Title
1/460	2017-03-17	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D SG1 on recent meeting reports of Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF)
1/456	2017-03-17	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D SG1 on Call for voluntary contributions to the ITU Accessibility Fund
1/411	2017-02-14	ITU-T/ITU-R Inter-Sector Rapporteur Group	Liaison Statement from ITU IRG-AVA to ITU-D SG1 Question 7/1 on collaboration
1/410	2017-02-08	ITU-T Study Group 16	Liaison Statement from ITU-T SG16 to ITU-D SG1 Question 7/1 on paper on the potential risk of using "Personal Sound Amplification Products" (PSAPs)
1/409	2017-02-08	ITU-T Study Group 16	Liaison Statement from ITU-T SG16 to ITU-D SG1 Question 7/1 on easy access tool for emergency situations
RGQ/266	2016-10-31	ITU-T Study Group 2	Liaison Statement from ITU-T SG2 to ITU-D SG1 Question 7/1 on accessibility contributions
RGQ/263	2016-10-31	ITU-T Study Group 2	Liaison Statement from ITU-T SG2 to ITU-D SG1 Question 7/1 on accessibility contributions
RGQ/258	2016-10-31	ITU-T/ITU-R Inter-Sector Rapporteur Group on Audio Visual Media Accessibility (IRG-AVA)	Liaison Statement from ITU IRG-AVA to ITU-D SG2 on requirements for the application of the UNCRPD for media services for all (ITU-T FG-AVA Technical Report, Part 14)
1/286	2016-07-29	ITU-T JCA-AHF	Liaison statement from ITU-T JCA-AHF Chairman to ITU-D SG1 on JCA-AHF recent meeting report
RGQ/168	2016-02-19	CWG- Internet Secretariat	Liaison Statement on the results of the CWG-Internet open consultation on "Access to the Internet for Persons with Disabilities and specific needs"
RGQ/141	2016-02-12	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D SG1 on JCA-AHF recent meetings reports

Web	Received	Source	Title
RGQ/136	2016-02-04	ITU-T Study Group 2	Liaison statement from ITU-T SG2 to ITU-D SG1 Q7/1 on Accessibility Contributions
RGQ/129	2016-11-04	ITU-T Study Group 16	Liaison statement from ITU-T SG16 to ITU-D SG1 Q7/1 on other newly completed work on accessibility
1/202	2015-08-24	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF, Chairman to ITU-D SGs on Draft meeting report of Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF) in Geneva on 17 June 2015
1/120	2015-06-23	ITU-R Study Groups-Working Party 1B	Liaison Statement from ITU-R WP1B to ITU-D Study Group 1 on Working document towards a preliminary draft new report ITU-R SM on Innovative regulatory tools
RGQ/105	2015-03-31	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D Study Group 1 on the Draft meeting report of JCA-AHF held in Geneva on 18 February 2015
RGQ/104	2015-03-31	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D Study Group 1 on Cybersecurity/security on the Internet for persons with disabilities
1/28	2014-07-16	ITU-T Study Group 16	Liaison Statement from ITU-T Study Group 16 to ITU-D Study Group 1 Question 7/1 on Draft ITU-T F.ACC-Term
1/13	2014-05-05	ITU-R Study Group 5	Information on Question ITU-R 254-5
1/7	2013-10-03	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D SG1 and SG2 on draft revision of Recommendation ITU-R M.107
1/6	2013-10-02	ITU-T JCA-AHF	Liaison Statement from ITU-T JCA-AHF to ITU-D SG1 and SG2 on draft revision of Recommendation ITU-R M.1076 "Wireless communication systems for persons with impaired hearing"

国际电信联盟 (ITU)

电信发展局 (BDT)

主任办公室

Place des Nations
CH-1211 Geneva 20 – Switzerland
电子邮件: bdtdirector@itu.int
电话: +41 22 730 5035/5435
传真: +41 22 730 5484

副主任

兼行政和运营协调部负责人 (DDR)

电子邮件: bdtdputydir@itu.int
电话: +41 22 730 5784
传真: +41 22 730 5484

基础设施、环境建设和

电子应用部 (IEE)

电子邮件: bdtiee@itu.int
电话: +41 22 730 5421
传真: +41 22 730 5484

创新和

合作伙伴部 (IP)

电子邮件: bdtip@itu.int
电话: +41 22 730 5900
传真: +41 22 730 5484

项目和

知识管理部 (PKM)

电子邮件: bdtpkm@itu.int
电话: +41 22 730 5447
传真: +41 22 730 5484

非洲

埃塞俄比亚

国际电联

区域代表处

P.O. Box 60 005
Gambia Rd., Leghar ETC Building
3rd floor
Addis Ababa – Ethiopia

电子邮件: ituaddis@itu.int
电话: +251 11 551 4977
电话: +251 11 551 4855
电话: +251 11 551 8328
传真: +251 11 551 7299

喀麦隆

国际电联

地区办事处

Immeuble CAMPOST, 3^e étage
Boulevard du 20 mai
Boîte postale 11017
Yaoundé – Cameroon

电子邮件: itu-yaounde@itu.int
电话: +237 22 22 9292
电话: +237 22 22 9291
传真: +237 22 22 9297

塞内加尔

国际电联

地区办事处

8, Route du Méridien
Immeuble Rokhaya
B.P. 29471 Dakar-YoffDakar –
Sénégal

电子邮件: itu-dakar@itu.int
电话: +221 33 859 7010
电话: +221 33 859 7021
传真: +221 33 868 6386

津巴布韦

国际电联

地区办事处

TelOne Centre for Learning
Corner Samora Machel and
Hampton Road
P.O. Box BE 792 Belvedere
Harare – Zimbabwe

电子邮件: itu-harare@itu.int
电话: +263 4 77 5939
电话: +263 4 77 5941
传真: +263 4 77 1257

美洲

巴西

国际电联

区域代表处

SAUS Quadra 06, Bloco "E"
10^o andar, Ala Sul
Ed. Luis Eduardo Magalhães (Anatel)
70070-940 Brasília, DF – Brazil

电子邮件: itubrasilia@itu.int
电话: +55 61 2312 2730-1
电话: +55 61 2312 2733-5
传真: +55 61 2312 2738

巴巴多斯

国际电联

地区办事处

United Nations House
Marine Gardens
Hastings, Christ Church
P.O. Box 1047
Bridgetown – Barbados

电子邮件: itubridgetown@itu.int
电话: +1 246 431 0343/4
传真: +1 246 437 7403

智利

国际电联

地区办事处

Merced 753, Piso 4
Casilla 50484, Plaza de Armas
Santiago de Chile – Chile

电子邮件: itusantiago@itu.int
电话: +56 2 632 6134/6147
传真: +56 2 632 6154

洪都拉斯

国际电联

地区办事处

Colonia Palmira, Avenida Brasil
Ed. COMTELCA/UIT, 4.º piso
P.O. Box 976
Tegucigalpa – Honduras

电子邮件: itutegucigalpa@itu.int
电话: +504 22 201 074
传真: +504 22 201 075

阿拉伯国家

埃及

国际电联

区域代表处

Smart Village, Building B 147, 3rd floor
Km 28 Cairo – Alexandria Desert Road
Giza Governorate
Cairo – Egypt

电子邮件: itu-ro-arabstates@itu.int
电话: +202 3537 1777
传真: +202 3537 1888

亚太

泰国

国际电联

区域代表处

Thailand Post Training Center, 5th
floor,
111 Chaengwattana Road, Laksi
Bangkok 10210 – Thailand

邮寄地址:
P.O. Box 178, Laksi Post Office
Laksi, Bangkok 10210 – Thailand

电子邮件: itubangkok@itu.int
电话: +66 2 575 0055
传真: +66 2 575 3507

印度尼西亚

国际电联

地区办事处

Sapta Pesona Building, 13th floor
Jl. Merdan Merdeka Barat No. 17
Jakarta 10110 – Indonesia

邮寄地址:
c/o UNDP – P.O. Box 2338
Jakarta 10110 – Indonesia

电子邮件: itujakarta@itu.int
电话: +62 21 381 3572
电话: +62 21 380 2322/2324
传真: +62 21 389 05521

独联体国家

俄罗斯联邦

国际电联

地区办事处

4, Building 1
Sergiy Radonezhsky Str.
Moscow 105120
Russian Federation

邮寄地址:
P.O. Box 47 – Moscow 105120
Russian Federation

电子邮件: itumoskow@itu.int
电话: +7 495 926 6070
传真: +7 495 926 6073

欧洲

瑞士

国际电联

电信发展局 (BDT) 地区办事处

Place des Nations
CH-1211 Geneva 20 – Switzerland
Switzerland
电子邮件: euregion@itu.int
电话: +41 22 730 6065

国际电信联盟
电信发展局
Place des Nations
CH-1211 Geneva 20
Switzerland
www.itu.int

ISBN 978-92-61-22805-7



瑞士印刷
2017年，日内瓦