

THE ICT OPPORTUNITY FOR A DISABILITY- INCLUSIVE DEVELOPMENT FRAMEWORK

SYNTHESIS REPORT OF THE ICT CONSULTATION IN SUPPORT OF THE 2013 HIGH LEVEL
MEETING ON DISABILITY AND DEVELOPMENT

DISCUSSION PAPER

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This discussion paper provides a synthesis of the views collected in the ICT consultation in support of the HLMDD. Relevant stakeholders involved in the consultation are invited to provide additional views to this paper by sending written comments to accessibility@itu.int by **8 August 2013**.

Background information

The High-Level Meeting of the General Assembly on Disability and Development (HLMDD) provides a historic opportunity to bring global attention to the exclusion of children, women and men with disabilities from mainstream development-related activities which in turn, worsens the poverty, illiteracy, inequality, unemployment, and social welfare realities. Precisely at a moment when the international community is discussing the issues that will be reflected in the new framework development, the HLMDD presents an excellent platform for all stakeholders to work together towards the achievement of the United Nations' common goal: achieving sustainable development and collectively building inclusive knowledge societies in which persons with disabilities are both agents, beneficiaries and creators of development efforts.

In support of this historic event, and to contribute to a successful outcome of the meeting, the Broadband Commission for Digital Development, the Global Initiative for Inclusive ICTs (G3ICT), the International Disability Alliance (IDA), the International Telecommunication Union (ITU), Microsoft, the Telecentre.org Foundation and the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched a global consultation in 2013 to capture the recommendations from all stakeholders on the critical contribution of Information and Communications Technology (ICT), such as websites, mobile, radio and TV, as well as the work of other information and memory institutions of information such as libraries, archives, Internet information providers and others providing access to information and knowledge which is so required to achieve the inclusion and full participation of persons with disabilities in all aspects of society. The follow up interviews were carried out with prominent experts working in the subject area which were included in the report as case studies.

The consultation, which was conducted from 20 May 2013 to 17 June 2013, gathered over 150 expert inputs from relevant organizations and key individuals (see Annex I), representing various categories of stakeholders, including governments, academic institutions, organizations of persons with disabilities, civil society organizations, and private sector, stemming from over 55 countries, regional and international organizations.

More information about the consultation is available at the [ITU website on accessibility](http://www.itu.int/accessibility) (www.itu.int/accessibility).

This discussion paper provides a synthesis of the views collected in the consultation. Relevant stakeholders involved in the consultation are invited to provide additional views to this paper by sending written comments to accessibility@itu.int by **8 August 2013**.

About the partners in the consultation

(listed in alphabetical order)

The **Broadband Commission for Digital Development** is an initiative set up by ITU and the United Nations Educational, Scientific and Cultural Organization (UNESCO) in response to UN Secretary-General Ban Ki-Moon's call to step up efforts to meet the MDGs. Launched in May 2010, the Commission comprises government leaders from around the world and the highest-level representatives and leaders from relevant industries and international agencies and organizations concerned with development, providing a fresh approach to UN and business engagement. To date, the Commission has published two high level policy reports, as well as a number of best practices and case studies. More information about the Commission is available on the [Broadband Commission website](http://www.broadbandcommission.org) (www.broadbandcommission.org).

The **Global Initiative for Inclusive Information and Communication Technologies (G3ICT)** is an advocacy initiative of the United Nations Global Alliance for ICT and Development, launched in December 2006 in cooperation with the Secretariat for the Convention on the Rights of Persons with Disabilities. Its mission is to facilitate and support the implementation of the dispositions of the Convention on the Rights of Persons with Disabilities on the accessibility of Information Communication Technologies and assistive technologies. G3ict relies on an international network of ICT accessibility experts to develop and promote good practices, technical resources and benchmarks for ICT accessibility advocates around the world. It is incorporated as a non-profit organization in the State of Georgia, USA, and headquartered in Atlanta.

The **International Disability Alliance (IDA)** is a network of global and regional organizations representing persons with disabilities. The aim of IDA is to promote the effective and full implementation of the UN Convention on the Rights of Persons with Disabilities worldwide, as well as compliance with the CRPD within the UN system, through the active and coordinated involvement of representative organizations of persons with disabilities at the national, regional and international levels. IDA with its unique composition as a network of the foremost international disability rights organizations is the most authoritative representative voice of persons with disabilities and acknowledged as such by the United Nations system both in New York and Geneva.

The **International Telecommunication Union (ITU)** is the United Nations specialized agency responsible for telecommunications/information and communication technologies (ICTs). Its membership, comprised of 193 governments, over 700 private companies and more than 50 academic institutions, has called for ITU to take the lead in promoting ICT accessibility, as well as to promote the use of ICTs as a key enabler to achieve the socio-economic inclusion of persons with disabilities in all aspects of life. ITU is based in Geneva, Switzerland, with 12 field offices around the world. More information about ITU's activities on this domain is available on the [ITU accessibility website](http://www.itu.int/accessibility) (www.itu.int/accessibility).

Microsoft is the worldwide leader in software, services and solutions that help people and businesses realize their full potential. At Microsoft, our mission and values are to help people and businesses throughout the world to realize their full potential. We consider our mission statement a promise to our customers. We deliver on that promise by striving to create technology that is accessible to everyone—of all ages and abilities. Microsoft leads the industry in accessibility innovation and in building products that are safer and easier to use. Microsoft takes a strategic approach to accessibility by focusing on integrating accessibility into planning, design, research, development, testing, and documentation.

Telecentre.org Foundation supports the establishment and sustainability of grassroots level telecentres. These telecentres—public places of access to the Internet and other digital technologies that help promote personal and social development—offer crucial services, skills and opportunities to people living in remote and rural locations around the world. See more at the [Telecentre.org Foundation website](http://www.telecentre.org/who-we-are/#sthash.w4Jzvgyu.dpuf) (www.telecentre.org/who-we-are/#sthash.w4Jzvgyu.dpuf).

Since its foundation in 1945, **UNESCO** as the only United Nations specialized agency for education, science, culture, communication and information, works towards creating the conditions for peace and dialogue among civilizations, cultures and peoples, based upon respect for commonly shared human values. Being an international organization, UNESCO's unique competencies contribute as well to the realization of internationally agreed development goals. Through its large network of field offices and National Commission as well as a founder of numerous networks on various thematic areas around the world, UNESCO has a comparative advantage to act as a normative setter, catalyst of ideas, clearinghouse and capacity builder within the areas of its global mandate. The access to accessible information using ICTs for marginalized social groups, including persons with disabilities, is communicated in the UNESCO's strategic documents. UNESCO believes that the recognition of human rights and providing access to information and knowledge, particular through innovative use of media and ICTs, are conducive to ensure that every citizen, including persons with disabilities, could contribute to social and economic development.

Disclaimer

The information contained in this publication was provided by the authors and by the contributors to the case study, and does not engage or necessarily represent the opinions of the Broadband Commission for Digital Development, the Global Initiative for Inclusive ICTs (G3ICT), the International Disability Alliance (IDA), the International Telecommunication Union (ITU), Microsoft, the Telecentre.org Foundation or the United Nations Educational, Scientific and Cultural Organization (UNESCO), their membership and/or staff.

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[*] The team involved in the preparation of the report study included the following experts and staff from the partners of the consultation (listed alphabetically by organization):

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Executive summary

Across the globe, persons with disabilities still face significant barriers that limit their access to key public services such as health, education and information, reduce their opportunities to access the labour market and diminish their opportunities for independent living. With Information and Communication Technologies (ICTs) increasingly integrated into every aspect of the modern world, these ubiquitous technologies have become a positive force of transformation and a crucial element of any personal development / empowerment and institutional framework for and inclusive development. This paper aims to complement previous work on the use of ICT as an enabler of the social inclusion of persons with disabilities by further analysing the specific contribution that ICTs can make in addressing the remaining barriers still limiting the inclusion of persons with disabilities in national and international development agendas.

When ICTs are available, affordable and accessible, they significantly improve the inclusion of persons with disabilities in all aspects of society. Web services constitute the access technology with the greatest impact in promoting the inclusion of persons with disabilities. This contribution is closely followed by mobile phones, which, despite being one of the newest technologies from the ICTs assessed, constitute the second-most valued ICT with regards to its contribution for persons with disabilities. In particular, the use of mobile phones is instrumental in allowing the independent living of persons with disabilities. Television and television services is the third-ranked ICT in the assessment, specifically for its use as a tool to access government services and information.

However, even with this positive force of transformation key challenges remain to be addressed if persons with disabilities are to fully benefit from the use of ICTs. Some barriers are pervasive and affect all areas of development. Experts state that the cost of assistive technologies (ATs), which is comprised of the cost of the technology as well as the cost of AT assessment, training and support services, is still an important barrier that prevents persons with disabilities to fully access healthcare services, benefit at all educational levels, be competitive on the labour market and live independently. The lack of ICT accessibility remains a significant barrier which is observable in all areas of development. When ICTs are accessible, they are only available in a fraction of the hundreds of languages that are spoken all over the world- another barrier to be taken into consideration if this challenge is to be addressed effectively. Empirical evidence shows that this barrier is further maintained by the lack of policies which foster widespread availability of accessible ICTs and the lack of effective implementation of the aforementioned policies.

Among State Parties to the Convention on the Rights of Persons with Disabilities, few national governments have translated the provisions of Article 9 of the Convention into their legislative frameworks. In many cases policies promoting accessibility may be in place, but they lack of accompanying laws, legislations and regulations. Lastly, limited access to ICTs greatly constrains the use of ICTs as a solution to tackling development challenges. Addressing these barriers requires the collaboration across the board of the main stakeholders involved in each sector, as well as the definition of cross-sectorial policies and strategies so that the investments in improving access and accessibility of ICTs in one sector can impact positively other sectors.

There are also potential risks that should be taken into consideration to avoid the introduction of new barriers associated with the generalized use of ICTs in development efforts. These are: creating the expectation that accessible ICTs alone can remove the barriers faced by persons with disabilities, worsening the digital divide by not addressing the challenge of global access to ICTs and the pace of technological change which requires frequent revisions of accessibility-related guidelines and standards.

Experts contributing to this consultation have highlighted concrete actions to be undertaken by each group of stakeholders and have suggested possible indicators to monitor progress. Governments can play a key role in stimulating the introduction of ICT-enabled solutions adapted to the needs of persons with disabilities, increasing the availability of accessible ICTs and promoting the affordability of assistive technologies in social, educational, economic and other domains. These benefits can be achieved through the promotion of national innovation systems that foster private-public collaboration,

as well as development and diffusion of knowledge, accessible products and content as well as assistive technologies.

Private sector organizations need to increase research and development efforts, incorporate universal design principles at the earliest stage possible and recruit persons with disabilities in product development departments so as to successfully develop accessible ICTs. Another priority action identified for the private sector is to contribute to addressing the shortage of information technology professionals with ICT accessibility skills (in-house training, industry gatherings and publications). Lastly, the private sector has a vital role to play regarding the employment of persons with disabilities. By removing attitudinal barriers and making the workplace accessible, employers can greatly contribute to a society where persons with disabilities have a productive and independent life.

Civil society organizations can play a key role by raising policy-makers' awareness of the accessibility barriers that still need to be addressed, becoming more active in the work conducted by international standards organizations. Civil society organizations also have the ability to bring about social progress and economic growth by raising the awareness and building the capacity of persons with disabilities and their parents regarding what ICTs can do to facilitate their own economic and social inclusion. Finally, advocating for the mainstreaming of the use of the universal design principle in all development efforts is crucial for ensuring that the international development framework is disability-inclusive.

The expert views gathered in the consultation highlight that the most urgent action to be undertaken by the UN system is the implementation of operational activities to meet the disability-inclusive development goals, complemented by the monitoring and evaluation of development efforts at the global, regional and national scales along with the performance review to assess whether development policies, programmes and projects are effective and results-driven. In this respect, it is important to ensure that the analysis of results is quantitative and supported by consistent data. It is also important to ensure that analysis of results is designed with the participation of persons with disabilities, in order to make sure that the correct factors are measured. Lastly, the United Nations must ensure that it keeps implementing awareness-raising activities and mobilization campaigns in order to create a demand for national governmental action.

International organizations are another key category of stakeholders, as they also play a special role by providing a neutral platform from which to develop and/or harmonize international standards and provide recommendations related to accessible ICTs. Furthermore, international organizations can contribute to the promotion of research and development focused on developing specific ICT-enabled solutions for persons with disabilities. Lastly, international organizations bear the responsibility to raise policy makers' awareness of accessibility barriers to be addressed.

Defining measurable indicators has proven to be a valid strategy in advancing the implementation of the global development agenda. The consultation has gathered a set of indicators to support the definition of an action oriented agenda aimed at fulfilling the contribution of ICTs to achieve a disability-inclusive agenda.

The need to break down the barriers faced by persons with disabilities

Including persons with disabilities in all aspects of society is one of the remaining challenges of the global development agenda. Across the globe, persons with disabilities still face significant barriers that limit their access to key public services such as health, education and information, reduce their opportunities to access the labour market and diminish their opportunities for independent living.

The widespread adoption of the Convention on the Rights of the Persons with Disabilities (CRPD)ⁱ in 2006 implied a major step forward in advancing the inclusion of persons with disabilities, turning their socio-economic exclusion into a human rights issue. The CRPD places significant obligations on all state officials responsible for equal access to education and employment opportunities. With 155 signatories and 132 ratifications, the CRPD is on its way to becoming a truly universal policy, legislative, and regulatory framework for the Rights of Persons with Disabilitiesⁱⁱ. As this process continues, all stakeholders are focusing their attention on advancing its implementation, putting special emphasis on including specific references, actions and goals aimed at further integrating persons with disabilities as part of the new international development agenda. This new framework will come into force after 2015, the deadline established in 1999 for the achievement of the Millennium development Goals (MDGs)ⁱⁱⁱ.

In this context, the use of Information and Communication Technologies (ICTs) such as the Internet, mobile phones and radio or television services allow the removal of the remaining barriers faced by persons with disabilities. With ICTs increasingly integrated into every aspect of the modern world, these ubiquitous technologies have become a positive force of transformation and a crucial element of any personal development / empowerment and institutional framework for inclusive development. ICTs are already providing access to key public services, with widespread implications for social progress and economic growth aimed at eradicating poverty and promoting inclusive societies and sustainable development.

Furthermore, considering that 15 per cent of the world's population, or over one billion people, have a disability that affects their access to modern communications, there is a need to improve the access to ICTs for persons with disabilities (ITU^{iv} and G3ICT, 2012)^v.

This paper aims to complement previous work on the use of ICTs as an enabler of the social inclusion of persons with disabilities by further analysing the specific contribution that ICTs can make in addressing the remaining barriers still limiting the inclusion of persons with disabilities in national and international development agendas. Section 2 presents an overview of the areas of development in which ICTs have the greatest positive impact for persons with disabilities. In Section 3 the paper identifies the main challenges and risks that need to be addressed in scaling up best practices and turning the ICT opportunity into a global reality. Finally, Section 4 presents a proposed roadmap to move the ICT accessibility agenda forward, compiling a set of priority actions, indicators and goals for each stakeholder to maximize the contribution that ICTs can make to accelerate a disability-inclusive development agenda.

The ICT opportunity for persons with disabilities

While there are several definitions of ICTs, they all agree that ICT is an umbrella term which includes any kind of information and communication device or application and its content. Such a definition encompasses a wide range of access technologies, such as radio, television, satellites, mobile phones, fixed lines, computers and network hardware and software. The importance of ICTs lies in their ability to open up a wide range of services, transform existing service and create greater demand for access to information and knowledge, particularly in underserved and excluded populations such as persons with disabilities.

The ICT opportunity for persons with disabilities can be better assessed by analysing how each type of access technology contributes to the different dimensions involved in the social and economic inclusion of persons with disabilities. Following this approach, table 1.1 presents a synthesis of the expert view gathered in the ICT consultation^{vi}.

Table 1.1. Expert assessment of the contribution of ICTs to improving persons with disabilities' access to social and economic activities

4.0-5.0: To a large extent 3.0-3.9: To a moderate extent 2.0-2.9: To some extent 1.0-1.9: To little extent 0.0-0.9: Not at all	Websites	Mobile device and services	TV set and services	Radio	Other and emerging technologies	ICTs most impactful where?
Healthcare	3.3	3.1	2.9	2.5	2.7	2.9
Primary education	3.0	2.6	2.8	2.3	2.9	2.7
Secondary education	3.4	3.0	2.7	2.3	2.8	2.8
Tertiary, professional, lifelong education	3.7	3.4	2.9	2.4	2.8	3.0
Employment	3.7	3.3	2.5	2.2	2.7	2.8
Independent living	3.4	4.6	2.8	2.4	2.8	3.2
Government services	3.5	3.0	3.0	2.3	2.6	2.8
Participation in political and public life	3.3	3.1	2.7	2.5	2.6	2.8
Overall average	3.4	3.2	2.7	2.3	2.7	

Source: Authors, based on the results of the ICT consultation

Overall, web services constitute the access technology with the greatest impact in promoting the inclusion of persons with disabilities, based on the survey data. This contribution is closely followed by mobile phones, which, despite being one of the newest technologies from the ICTs assessed, constitute the second-most valued ICT with regards to its contribution for persons with disabilities. In particular, the use of mobile phones is instrumental in allowing the independent living of persons with

disabilities. Television and television services is the third-ranked ICT in the assessment, specifically for its use as a tool to access government services and information.

The following section presents best practices in the use of each of these technologies to promote the social inclusion of persons with disabilities. These best practices were shared by experts during the consultation process.

ICTs are enablers of social progress and economic growth

Proliferation of the web

The advent of the Internet has heralded a new age not only of information sharing, but of the proliferation of web-based services that serve disabled and non-disabled communities alike. Through the Internet, users can remotely participate in a range of activities such as tertiary, professional, lifelong education, employment, economic, government services and consumer activities. Opportunities for social participation also include social networking, news access, online interest groups, healthcare needs, video, audio and text communication, cloud-based sharing and media interaction. For persons with disabilities, these services and content are made further accessible through both computer-based and web-based accessibility applications such as screen readers, speech recognition and visual assistance.

“The Internet has acted as a platform for collaboration for all types of organisations. It has allowed for all citizens, including people with disabilities, to engage more actively in political and social life. . . The Internet in itself could be considered an assistive technology, allowing voices to be heard that traditionally could not be.”

Association for Progressive Communications

In addition, the move to cloud computing and the benefits gained from its processing capability for performing complex operations will likely result in substantial improvements in the quality and availability of accessible ICTs. However, it should be noted that access to the cloud via the Internet is a prerequisite for these technologies to become available and mainstream.

Websites can provide visual, audio and text output on demand and offer multimedia input opportunities to users, making uni-functional radio and schedule-driven TV broadcasting technologies increasingly irrelevant. For persons with disabilities, multi-functional online environments help streamline services and move the status quo away from dependence on single-function, cumbersome, cost-prohibitive and often inaccessible devices.

In fact, websites and web applications have a greater impact on improving persons with disabilities’ access to socio-cultural, educational and economic activities than any other ICT, with the exception of mobile phones’ impact on independent living.

“Access to a computer is one of the greatest equalizers for people with disabilities. The ability to operate a computer and perhaps even program an application allows an individual with a disability to find a passion, find a career and become financially independent.”

DIY Ability

Box 1.2. Testimonial. Access to ICTs has been vital for me to achieve full participation in all aspects of life and society.

Without access to ICTs, assistive technologies or specially-developed ICTs, people with disabilities are disenfranchised and are denied equal access to education, culture, and everyday services. This ends up restricting their job opportunities and their possibility for independent living. As a blind person myself, using ICTs is what enabled me to finish my school and university education and complete my academic training, master's degree and internships.

Access to ICTs has been vital for me to achieve full participation in all aspects of life and society, and will continue to be so for the rest of my life. I frequently use the internet and digital libraries, and can access information about basic things for independent daily living, such as public health information. ICTs have enabled me to access books for pleasure and for education, and I benefit from audio-description to enjoy culture through cinema, museums and documentaries.

ICTs help me use my bank account through ATMs, find my way around cities on my own guided by maps and GPS, accessing crucial information such as public transport routes and timetables. Through ICTs I benefit from e-government services and regularly make electronic payments. ICTs also make it possible for me to communicate on an equal basis with others.

If you cannot access education, you cannot get access to the labour market and you cannot achieve independent living.

Although my academic background provided me with *the* knowledge and skills necessary for exciting career possibilities that would not have been possible without proper access to ICTs either through universal design or through assistive technology. Therefore, ICTs are the key that opens the door to full participation for people with disabilities.

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Mobiles: Form and function relevant

More than any other ICT in use today, mobiles and mobile services have far and away the greatest impact on independent living for persons with disabilities. At the base level, feature phones provide a means of on-demand communication for the user through both SMS and voice calls. This in itself can enable independent living by ensuring that emergency services, family members, personal aides, assistive and everyday services are just a call or text away. At an accelerated level, smartphones provide not only an assurance of telecom network access, but they address the unique sensory, physical and cognitive needs of customers with disabilities. Smartphones are now produced in a variety of styles rated for hearing aid compatibility, and customers can enjoy closed-captioned multimedia content, use face-to-face video chat applications to communicate via sign language, access content non-visually through screen reading applications, customize alert settings to use a combination of audible, visual and vibration alerts and take advantage of voice-commands, adjustable font sizes, predictive text and a range of other innovative features, accessories, and third-party applications^{vii}. Furthermore, mobile devices are designed to be portable and are easily worn or carried by the user, unlike a laptop computer or television. For a person with disabilities, having a mobile device increases independent living not only because of the services it offers software and Internet-wise, but because it enables access to those services immediately at the time of need.

Device and software cost is a huge consideration when it comes to access to ICTs. While complex, function-specific devices may be cost-prohibitive for many persons with disabilities, smartphones and tablets offer high-quality, portable, easily-customizable systems for a fraction of the cost of a new computer. Increasingly, these devices are appearing on the market with accessibility systems built-in, and the prevalence of free applications on the Apple, Android and, Windows Phone apps markets also enable low- to no-cost software options for assistive and other services.

Box 1.3. Accessible technology entering the mainstream and transforming lives

As the technology gets smarter, offering a new freedom of movement for many disabled people, let's not forget the relatively simple things. With a few tweaks, such as a talking dashboard, this revolutionary form of transport [the car] can become accessible to blind people, who need to know where they are and when it's safe to get out.

Many cheaper technology products can't afford to have this level of sophistication, but almost every piece of equipment contains a chip – even the humble toaster. I'm not about to suggest that this modest but essential piece of kitchen equipment should come equipped with voice-activated controls, but it is among thousands of products and services that could become accessible through extensibility. This means that it is designed specifically to allow its capabilities to be extended or added to. So while it may not be commercially viable to offer text-to-speech controls on a fridge or a chasm machine, these devices could have the ability to link to others, that are themselves smarter and have these core technologies built-in (a smartphone, for example).

Excerpt of an interview of Robin Christopherson, Head of digital inclusion at AbilityNet. (Guardian, 4 February 2013)

Radio and TV sets and services

Because both websites and mobile devices have experienced a gigantic boom in popularity and prevalence over the past two decades, it is expected that they would be perceived as more impactful for social and economic participation than some of the more longstanding ICTs. Radio, which has long been an indispensable means for persons with sight disabilities to access information, is perceived as less impactful nowadays. As far as television sets and broadcasting services are concerned, they continue providing visual, audio and text output through closed captioning. However, these are being challenged by video streaming and on-demand news coverage via the internet, which are quickly becoming ubiquitous.

Box 2.3. presents technologies that have proven successful and which have significantly improved the inclusion of persons with disabilities in all aspects of society.

Box 1.4. Impactful Technologies

The technologies highlighted below have proven successful and significantly improved the inclusion of persons with disabilities in all aspects of society.

- | | |
|--|-----------------------------|
| <ul style="list-style-type: none">• Websites: online educational courses, social networking, shopping• Chat systems: VoIP, audio, video, text, sign language, text to avatar• Telework: online jobs and training, virtual collaboration• Telemedicine and E-health | Internet |
| <ul style="list-style-type: none">• Sign language interpretation over the web• Accessibility software: screen reading, voice to text, screen typing• Accessible eBooks and e-documents• Gamified apps for special education and recreation• Open source software | Software and apps |
| <ul style="list-style-type: none">• Smartphones and Tablets• SMS• Mobile banking services | Mobile devices and services |
| <ul style="list-style-type: none">• Access services: text subtitles, audio subtitles, descriptive video | TV sets and services |
| <ul style="list-style-type: none">• Hearing Aids• Smart homes• Emerging ICTs• Artificial intelligence – robots, digital human modelling, emotion recognition• Emergency communication response – satellite | Emerging ICTs |

Source: Authors

Box 1.5. Emerging ICTs: Enabling Persons with Disabilities at Home and Away

A new development is to make access services available via Integrated Broadcast-Broadband (IBB) systems. The advantage of the IBB approach is that the delivery via broadband telecommunication networks allows the representation of access service exactly according to the needs of the people with disabilities without causing any disturbance to those that do not need these services. In this case, the access services can be displayed (video, images, sound, text, graphics, and data) either on the main screen (or the main loudspeakers) or on a second screen (normally a type of tablet PC). By means of the second screen, people with disabilities are individually served even when watching TV together with their friends or their family.

International Telecommunication Union, Radiocommunications sector^{viii}, Study Group 6 - Broadcasting service

“ . . . Satellite networks/applications in the mobile-satellite service (MSS) can help to remove barriers and promote full participation/socio-economic inclusion of persons with disabilities. . . This particular case of a deaf person sailing single-handedly round the globe, a world first, while staying connected throughout his eight-month challenge via the Inmarsat network, brilliantly shows that satellite services can assist persons with disabilities to be really and fully included in our contemporary world, even under the most extreme conditions.” <http://www.satnews.com/story.php?number=1596483898>

International Telecommunication Union, Radiocommunications sector, Study Group 4 - Satellite

Box 1.6. Determining how persons with disabilities interact with ICTs

Accessibility guidelines

One of the most important developments for utilization of ICTs by persons with development is the defining and implementation of accessibility guidelines to ensure ease of use by persons with disabilities. For instance, the Web Content Accessibility Guidelines (WCAG) are highly recommended in defining the accessibility of web content. Implementing these guidelines can reduce or remove various accessibility barriers. Empirical evidence shows that the adoption of these guidelines improves user experience and accessibility for all persons, regardless of disability.

Standards

Standardization is a key vehicle to develop global telecommunications/ICT standards that include accessibility features. In this regard, one important goal of standardization-related activities is to make sure that newly developed standards contain the necessary elements to make services and features usable for people with as broad a range of capabilities as possible. As standards describe how equipment interacts and defines the quality necessary for media to be usable for all, they should also describe suitable methods of media delivery for people with disabilities, and are therefore essential for the provision of services accessible for all.

Also, the implementation of conformance and interoperability assessment principles in the standardization work could guarantee to the customer the compatibility of tested ICT products and their ability to work in the different network environments. For this reason, it is highly recommended to add the relevant requirements in standards developments. This is especially true for upcoming technologies, which might be part of ICT products for persons with disabilities.

Lastly, governments, industry and private sector organizations, research centres as well as organizations representing persons with disabilities are encouraged to contribute to the work of international standards organizations such as the ITU's Standardization sector^{ix}, the International Electrotechnical Commission (IEC), the World Wide Web Consortium (W3C), and other appropriate fora. These organizations are integral in defining and proliferating technical standards that contribute to mainstreaming accessible ICTs.

Source: Authors

Understanding the challenges

As outlined in Section 2, the use of ICTs is deeply woven into the fabric of society and has become a crucial element of any personal development / empowerment and institutional framework for inclusive social progress and economic growth. However, even with this positive force of transformation key challenges remain to be addressed if persons with disabilities are to fully benefit from the contribution ICTs can make to facilitate their inclusion in development efforts.

Pervasive barriers

Some barriers are pervasive and affect all areas of development. Experts state that **the cost of assistive technologies** (ATs), which is comprised of the cost of the technology as well as the cost of AT assessment, training and support services, is still an important barrier that prevents persons with disabilities to fully access healthcare services, benefit at all educational levels, be competitive on the labour market and live independently. When ATs are free, ATs or embedded accessibility features in commodity products might remain unused if there is a lack of training of experts and of rehabilitation professionals. As far as the market price of AT is concerned, there is a significant price variation between highly sophisticated standalone condition-specific solutions and user interfaces to facilitate the use of commodity ICT products such as phones or PCs which do not have embedded accessibility features. When considering that persons with disabilities are among the most vulnerable groups in the world and that 80% of them live in developing countries, it can be argued that the aforementioned challenges related to the AT ecosystem are a strong barrier^x to full participation. It deprives persons with disabilities from the opportunity to use ICTs for living independently and participating in economic, social and political activities. Overall, the main challenge to the availability of assistive technologies are the lack of awareness and the lack of an effective training, support and services ecosystem in-country. Typically, there are three channels supporting assistive technologies: the education system, rehabilitation and community centres, and employment support services. Many countries with low income per capita have limited or no assistive technology programs in those three areas. As an example, recent studies show a straight linear relationship between the availability of assistive technologies at universities and country income per capita (G3ICT, 2012).

Table 2.1. Impact of countries' income per capita on the availability of Assistive Technologies at major universities

States Parties Level of CRPD ICT Accessibility Compliance by Income per Capita	High Income	Upper- Middle Income	Lower-Middle Income	Low-Income
Assistive Technology Available to Persons with Disabilities at Major Universities	83%	53%	44%	30%

Source: 2012 CRPD ICT Accessibility Progress Report – G3ict

The **lack of ICT accessibility** remains a significant barrier which is observable in all areas of development. When ICTs are accessible, they are only available in a fraction of the hundreds of languages that are spoken all over the world- another barrier to be taken into consideration if this challenge is to be addressed effectively. The CRPD 2012 ICT Accessibility Progress Report showed that screen readers are only available in the principal language of 63% of the countries which have ratified the CRPD but they are only available in 19% of those countries' minority languages (G3ICT, 2012).

Looking into the issue of inaccessibility, empirical evidence shows that this barrier is further maintained by the **lack of policies which foster widespread availability of accessible ICTs and the**

lack of effective implementation of the aforementioned policies. Among State Parties to the CRPD, few national governments have translated the provisions of Article 9 of the Convention into their legislative frameworks. In many cases policies promoting accessibility may be in place, but they lack of accompanying laws, legislations and regulations.

Lastly, **limited access to ICTs** greatly constrains the use of ICTs as a solution to tackling development challenges. This barrier exacerbates the social, educational and economic inequalities for persons with disabilities living in countries where the lack of access to ICTs and capacities to use them is a societal issue.

Areas of development and related/specific barriers

The tables 2.2., 2.3. and 2.4. present barriers identified by the expert views gathered in the context of the consultation in the areas of lifelong learning, employment and independent living. Annex I presents all the results gathered relating to the prioritization of main challenges to be addressed to maximize the ICT opportunity for persons with disabilities in each area of development.

Addressing these barriers requires the collaboration across the board of the main stakeholders involved in each sector, as well as the definition of cross-sectorial policies and strategies so that the investments in improving access and accessibility of ICTs in one sector can impact positively other sectors.

Inclusive ICTs for lifelong learning of persons with disabilities

Table 2.2. Main challenges to be addressed for enabling lifelong learning of persons with disabilities

PRIMARY EDUCATION

Challenges	Priority
Lack of policy implementation and/or lack of effective implementation mechanisms	#1
Limited access to technology	#2
Lack of policies which foster widespread availability of accessible ICTs	#3

SECONDARY EDUCATION

Challenges	Priority
Cost of assistive technology	#1
Lack of policies which foster widespread availability of accessible ICTs	#2
Lack of accessibility of ICT devices	#3

TERTIARY, PROFESSIONAL, LIFELONG EDUCATION

Challenges	Priority
Cost of assistive technology	#1

Challenges	Priority
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	#2
Lack of policies which foster widespread availability of accessible ICTs	# =3
Lack of policy implementation and/or lack of effective implementation mechanisms	# =3

Source: Authors, based on the results of the ICT consultation

It is important to note that many persons with disabilities and many other people close to them or those who provide assistance are not aware of how ICTs can help them access education throughout lifetime.

Box 2.3. Guiding principles for introduction of ICTs in teaching and learning of persons with disabilities.

Communication is essential to all forms of social interaction and participation. The technologies help people to communicate in many different and more effective ways. Indeed, widespread usage and growing of ICTs into more and more integrated in every aspect of life plays an important role in building societies that are more inclusive persons with disabilities. In fact ICTs ensure that persons with disabilities have a greater access to knowledge and independent living. However, there are few principles that should be taken into consideration while of introducing ICT.

Firstly, ICTs need to be accessible to all persons and not just to persons with disabilities. One/All persons ought to be able to access the ICTs that help to facilitate communication in different cultural, educational, and professional situations.

Another principle is “what form should technology that is used take?” ICTs ought to foster greater participation and inclusion. Mobile technologies for example enable access for everyone including Persons with disabilities, to any service at the time of need, thus unleashing huge potential for independent living within inclusive societies.

Additionally, where possible, technologies ought to be designed to be as inclusive as possible to all persons, as opposed to the development of some technologies that would only be used specifically by persons with disabilities, and some technologies that can only be used by people without disabilities. This is important to help facilitate greater inclusion and universal accessibility to mainstream communication technologies.

A further important principle refers to the level of independence and control persons with disabilities have in their use of ICTs. Indeed, all persons, including those with disabilities have unique preferences for particular technologies and they ought to be able to choose the ICT that best serves their needs. It is important to take into consideration that the primary purpose of any ICT is that it be controlled to fulfill the functions required by its user.

Finally, it is critical to consider behavior of the community that surrounds persons with disabilities. Communication that harnesses ICTs may require more time and effort for persons with disabilities. For this reason, members of the community should understand and aware, particularly those involved in teaching processes. ICT training courses should play a part in standard teacher training programs to make them aware of the different uses and users of technologies.

In conclusion, these general principles may guide the decisions one makes about the types of technologies that should be used. With that said important questions remain in terms of content accessibility. There is a clear need for standards to be developed that ensure that ICT is used to make content more accessible in different forms to persons with varying abilities and disabilities.

Excerpt of an interview of Douglas Biklen (USA) wins UNESCO/Emir Jaber al-Ahmad al-Jaber al-Sabah Prize to Promote Quality Education for Persons with Intellectual Disabilities 2011.

Access to information and knowledge is an essential component of inclusive social and economic development. In this regard, one important barrier worth consideration in this area of development is the school teachers’ lack of competencies to use ICTs. When the teachers lack the required competencies which include not only command/knowledge, but also skills and right attitudes towards use of ICTs and AT in educational settings; it is very difficult to use these technologies for setting inclusive classrooms open to the participation of persons with disabilities.

Table 2.4. Main challenges to be addressed for enabling access to job opportunities persons with disabilities

EMPLOYMENT

Challenges	Priority
Cost of assistive technology	#1
Lack of policies which foster widespread availability of accessible ICTs	#2
Lack of policy implementation and/or lack of effective implementation mechanisms	#3

Source: Authors, based on the results of the ICT consultation

As far as employment is concerned, attitudinal barriers are still highly prevalent in the workplace. Persons with disabilities are perceived as unable to perform highly-skilled jobs. This barrier creates a situation where the only jobs available for persons with disabilities are low-skilled labour, a sector in which persons with disabilities are severely affected by unemployment. OECD research have shown that persons with disabilities are twice as likely to be unemployed all over the OECD and that, when employed, persons with disabilities work part-time or at reduced hours more often than others. Consequently, the purchasing power of persons with disabilities is comparatively lower than other groups, in turn aggravating the issue of affordability of accessible ICTs.

“The integration and usage of accessible ICT products and services, and the reasonable accommodation of the workplace (including the provision of the necessary assistive technologies) facilitate the incorporation of [persons with disabilities] in the labour market.”

Fundación Once

Maximizing the ICT opportunity for enabling independent living

As far as independent living is concerned, the main challenges to be addressed are the cost of assistive technology, limited access to technology and the lack of accessibility of ICT devices. It should be noted that these challenges are currently worsened by both the lack of awareness from the ICT industry of the needs of persons with disabilities, and the current lack of accessibility skills among rehabilitation specialists and limited content available in accessible for persons with disabilities formats.

Table 2.4 Main challenges to be addressed for enabling independent living for persons with disabilities

INDEPENDENT LIVING

Challenges	Priority
Cost of assistive technology	#1
Limited access to technology	#2
Lack of accessibility of ICT devices	#3

Source: Authors, based on the results of the ICT consultation

“ICTs have to be seen as enablers of persons with disabilities’ social inclusion and one of their scopes is to foster independent living. In fact, there should not be equipment’s differences between a place of living and a place of work. If it is the case, technologies should be as similar or closed as possible. Indeed, learning how to use an innovative ICT and assistive technologies can take more time than expected and can be hard for Persons with disabilities so their professional and personal environment should take into account this difficulty. It is expected that inclusive society should create a harmony between all and everywhere so that there should not be any abrupt changes in Persons with disabilities’ daily lives. With this framework in mind, new technologies can be really helpful. Thus, more ICTs are easily accessible it will be easier for Persons with disabilities to have an independent living. Moreover, earlier a child with disabilities learns to use technologies, easier it is for him/her to learning”

Ms. Loubna Cherif Kanouni, President and Founder, Moroccan Association for Children with Cerebral Palsy and Mental Retardation (AMI), Morocco.

Providing services for persons with disabilities

Information providers such as libraries are at the center of expertise where persons with disabilities could ask and receive professional advice about e-content and on how best to read by taking into account any type of disability and accommodations required. However, in many countries access to libraries and services using ICTs are not fully available for persons with disabilities. In countries where libraries provide special services, most of them still require for retention of extensive patron records, such as user’s transaction histories. It has both positive and negative side as libraries should assume their responsibility for protecting the confidentiality of all personally identifiable information entrusted to them to perform services from one side, but from other side they could become a valuable and reliable source of information for the development of new ICTs, services and content as they are close to those who require them. In order to benefit maximum of the ICT development, professionals such as librarians should be equipped and trained to use ICTs and ATs in order to provide professional assistance.

Box 2.5. Librarians as service providers to persons with disabilities

Librarians as information providers ought to serve as a center of expertise where persons with disabilities may seek advice regarding e-content and how best they may access content in terms of their specific set of abilities. To provide these public services, a person who works in a library should have some key elements in mind and the following information could be included in their training on disability related aspect.

The provision of this public service would require library professionals to develop awareness of the following points and principles during their training on disability-related issues:

First of all, they should have a general knowledge of the different digital formats. For instance, even if a text may appear on a screen it doesn't mean necessarily that it is accessible. Library professionals ought to be able to access alternative formats of content suited to users' specific needs.

Moreover, library professionals should be familiar with the emerging e-reading system and of what the market is or will be able to provide in terms of e-reading. This would allow them to give advice on how to read without a printed book. Moreover librarians in general should have knowledge regarding specialized libraries (for instance "librarian of the blind") or other providers that exist to meet the varied demands of persons with disabilities. Furthermore, e-readers vary in their settings and user technology and librarians should be able to advice on their specificities.

Finally, they ought to have a general understanding of the ways different disabilities can influence reading abilities so as to help persons with disabilities efficiently.

Not only do individuals respond differently to their disabilities, and it is important to be conscious of different cultural reactions to persons with disabilities that may further affect the way persons with disabilities approach their own disability. Librarians should be sensitive to these issues and where necessary apply the appropriate tools to deliver the best possible assistance and advice.

As an addendum, librarians as data-suppliers could have added significant value for policy makers and industry. Libraries may be seen as data-providers to policy and decision-makers on the needs of persons with disabilities by registering valid, in-depth information on each PWD needs and required assistance. This long-term monitoring of information would foster a better understanding of each PWD's needs, whilst also enhancing librarians' abilities to deliver long-term support.

Meanwhile, librarians can play an important role as data-providers for industry. For example, if sanctioned by the national law register, they may benefit ICT companies by supplying information regarding their customers' registered disabilities. Librarians could also provide anonymous information regarding special needs for persons with disabilities that assistive technology companies have limited awareness of.

Excerpt of an interview of Koen Krikhaar, Chair of International Federation of Library Associations (IFLA), section Libraries serving Persons with Print Disabilities, Holland.

Additional challenges to be considered

First, the frequency spectrum presents a challenge in the availability of suitable frequency ranges for supporting the wireless communications needs of persons with disabilities. One particular challenge is the difficulty in finding suitable frequencies for hearing aids. This challenge will worsen as new wireless applications are implemented to support people with disabilities, including the transmission of visual and tactile signals. Rather than dedicated frequencies for each application, multi-purpose wireless personal area networks with access priorities may be more appropriate for network implementation.

Second, further and on-going research is necessary to better understand the challenges faced by persons with disabilities. Particularly needed is research and building of knowledge in evaluation methods for disability-inclusive projects and policies and cross-disciplinary studies adopting a holistic perspective.

Third, some of the most successful examples of inclusion of persons with disabilities have witnessed catalytic integration of various stakeholders in different sectors of society coming together to work for improvement and change. As an example, Copenhagen underwent drastic accessibility overhaul after valuable collaboration amongst stakeholders. Now the city is a paragon of accessible infrastructure and services for persons of all abilities. The only way projects can gain momentum and make a difference is if all actors are involved in building a more inclusive society.

The way forward

Without a doubt, ICTs have a key role to play in enabling a post-2015 development framework in which persons with disabilities are both beneficiaries and agents of development efforts. However, the international community must address the existing interdependent barriers outlined in the previous section in order to fully leverage the potential of ICTs in the lives of persons with disabilities.

There are also potential risks that should be taken into consideration to avoid the introduction of new barriers associated with the generalized use of ICTs in development efforts. The main risk is creating the expectation that accessible ICTs alone can solve all the challenges faced by persons with disabilities. Maximizing the potential benefit of ICTs requires a proper understanding of the full range of challenges and barriers faced by persons with disabilities in each local context, as well as a proper definition and implementation of effective national public policies so that the right ICT-enabled services can be introduced. Furthermore, it is important to acknowledge that not all disabilities are equal, and the interventions using ICTs could radically vary. The implementation and use of ICTs will not have the expected results unless these pre-conditions are met. For instance, attention should be paid to avoid that widespread accessible ICTs phase out the need for the deaf people to learn sign language or for the blind to learn Braille, especially when this is already becoming a trend. It is important to stress that learning sign language and braille are a fundamental part of intellectual development since it is related to acquiring language and reading and writing skills, and that ICTs should not be seen as a substitute for that, but as another layer of communication and inclusion.

The second most relevant risk identified in the consultation is a possible widening of the digital divide, as the current costs of assistive technologies may introduce the digital exclusions of persons with disabilities in developing contexts—a group which represents 80% of persons with disabilities—who may not be able to afford these technologies. While progress is being achieved in ensuring a greater availability of accessible ICTs, the cost of assistive technologies and the lack of widespread access to ICTs are risk factors to be taken into account when designing national strategies to promote the inclusion of persons with disabilities.

The pace of technological change is also a risk to be considered. Often ICTs with accessible features lags behind with new generations of ICTs coming out as often as every six months.

These and other risks are addressed in this section, which presents a set of priority actions to be undertaken by each major group of stakeholders to leverage the ICT opportunity for persons with disabilities.

The role of Governments

Governments can play a key role in stimulating the introduction of ICT-enabled solutions adapted to the needs of persons with disabilities, increasing the availability of accessible ICTs and promoting the affordability of assistive technologies in social, educational, economic and other domains. These benefits can be achieved through the promotion of national innovation systems that foster private-public collaboration, as well as development and diffusion of knowledge, accessible products and content as well as assistive technologies.

The number of State Parties to the United Nations Convention on the Rights of Persons with Disabilities is growing around the world. However, more work is required at policy level in order to foster a greater awareness that the UN Convention is a comprehensive and integral normative instrument which highlights the importance of ICTs and accessibility. Accessibility and use of ICTs by persons with disabilities should be seen as an integral part in enabling them to enjoy all human rights and fundamental freedoms.

It is important to raise awareness among policy/decision makers that there is a great need for elaboration of interlinked normative frameworks regarding use ICTs and assistive technologies by persons with disabilities. UNESCO Global Report^{xi} (2013) states that there are very few countries with a dedicated one ministry for people with disabilities. In most cases, interventions for disabled people happen across multiple agencies or ministries of government. This is why it is not easy to ensure a coherent and holistic response to the needs of persons with disabilities.

Table 4.1 presents the prioritization of actions defined by the expert views gathered in the consultation.

Table 4.1. Priority actions for governments

GOVERNMENTS

Priority actions	Prioritization
Strengthening research and development to develop new ICT-enabled solutions for persons with disabilities	#1
Incorporating accessibility requirements in procurement policies	#2
Updating disability legislation to include ICTs in the legal definition of accessibility	#2

Source: Authors, based on the results of the ICT consultation

The notion of accessibility entails the removal of environmental barriers that prevent persons with disabilities from participating in any social, economic and political activity. When leveraging their spending power in buying goods and services, national governments can address the market failure whereby demand for accessible products and services does not meet the offer of these products because of their lack of availability, affordability and/or accessibility.

Introducing procurement policies that incorporate accessibility-related requirements in their call for tenders has the potential to create a critical mass, conceivably turning the market of accessible products into an interesting and profitable one for vendors, developers and manufacturers. Such competitive market would lead to a greater availability of these products, consequently decreasing their final price for persons with disabilities.

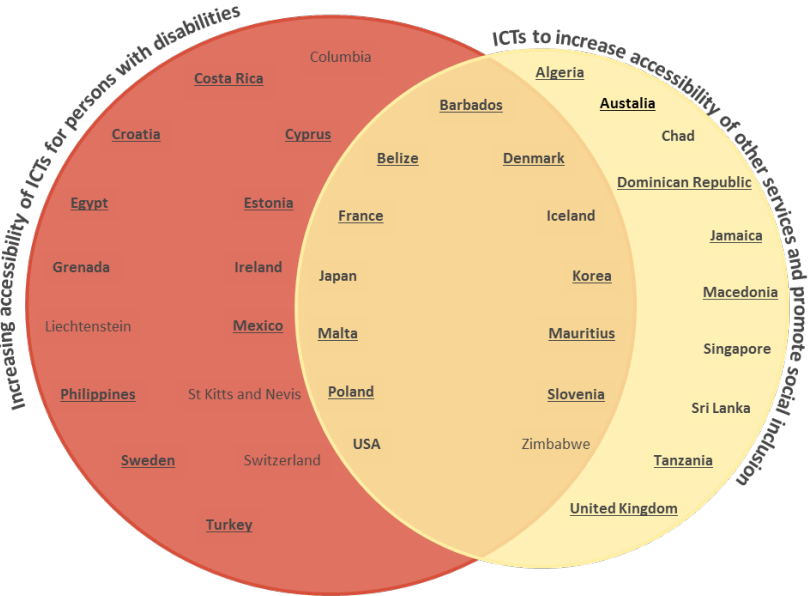
This is particularly important when considering that while the population that benefits from accessible ICTs is large, each individual group of users with disabilities (*e.g.* mobility, sensorial or cognitive) may not be enough to influence market forces. National regulators and policy makers can address this market failure through public intervention and activities such as, but not limited to, the incorporation of accessibility requirement in public procurement policies, the introduction of subsidies and the strengthening of research and development.

While it is widely acknowledged that ICTs further enable the participation and inclusion of persons with disabilities in social, economic, political and cultural life, the reference to ICTs is rarely incorporated into disability-related legislation. The Broadband Commission for Digital Development recently conducted a review on the inclusion of key socio-economic policy issues such as youth, gender and ICT accessibility in national broadband policies (March 2013). The results of this review show that only 37% of the policies analysed include relevant references to ICT accessibility. In comparison to the other ten issues examined in the analysis, ICT accessibility was the third-to-last in national broadband policy inclusions.

When looking at the references made to ICT accessibility in national broadband plans, researchers found that 14% of these policies referred to “improving the accessibility of ICTs” while only 5% referred to “promoting economic and social inclusion through the use of accessible ICTs” and 16% of the plans included both mentions (see figure 4.2).

Similarly, the 2012 G3ict CRPD ICT Accessibility Progress Report found that only 36.4% of countries which have ratified the CRPD have a definition of accessibility which includes ICTs or electronic media in the country laws or regulations.

Figure 4.2. Countries that include ICT accessibility in their national broadband plans (Description of the Venn diagram)



Source: ITU, 2013 and analysis made by the Secretariat of the Broadband Commission
 Note: Uganda features references to accessibility which do not fit into one of the three categories

Bold: countries that have signed the CRPD

Bold and underlined: countries that have signed and ratified the CRPD

Source: ITU

This additional knowledge demonstrates that there is a lack of understanding of the opportunity that ICT accessibility represents for enabling the social and economic inclusion of persons with disabilities. In many countries, the definition of disability is complex and evolving as well as can also differ significantly from one country to another. It has an impact on interventions, recourses and tools needed or to be allocated. The lack of understanding that ICTs and assistive technologies play an important role in helping persons with disabilities to make the transition from education to work (from acquisition of soft skill to technical, and societal skills) is also linked to societal attitudes, existing stereotypes, and even harmful practices. Furthermore, updating disability legislation to include ICTs in

the legal definition of accessibility would also allow for mainstreaming disability in ICT-related policies, plans and programmes. Lastly, the opportunities brought by universal service funds are often put forward to finance or subsidize accessibility-related initiatives. Considering this recommendation, effective legislation is a critical prerequisite to bring about effective and sustainable improvements.

By undertaking these three priority actions, governments will be create an enabling environment that provides incentives to other stakeholders to advance the inclusion of persons with disabilities in development efforts.

The role of Private Sector

Private sector organizations are already playing a key role in designing, manufacturing, developing and putting into the market key ICT-enabled solutions for persons with disabilities. However, this crucial contribution may currently be limited due to the high cost that many of these solutions imply for persons with disabilities, in particular in developing contexts. Addressing this issue and introducing measures to lower the cost of assistive solutions is the main priority area identified in the context of the consultation (see table 4.2).

Table 4.3 Priority actions for the private sector

PRIVATE SECTOR

Priority actions	Prioritization
Lowering the cost of assistive technologies	#1
Training information technology professionals on ICT accessibility	#2
Strengthening research and development to develop new ICT-enabled solutions for persons with disabilities	#3

Source: Authors, based on the results of the ICT consultation

Increasing research and development in this area and incorporating universal design principles at the earliest stage of product development would be two approaches to address the cost issue. Although these actions may mean higher development costs, this additional investment presents an important market opportunity, considering that the annual disposable income of persons with disabilities and relatives’ target market represents US\$9 trillion^{xiii}.

Available best practices indicate that a way to lower the increased cost of product development would be to actively recruit persons with disabilities for product development departments, and to involve persons with disabilities in early development stages, testing, focus groups, as well as at various decision-making levels. These measures allow private sector organization to incorporate the personal experiences and insights of each group of persons with disabilities so that new products are accessible by design.

Another priority action is to address the shortage of information technology professionals with ICT accessibility skills. This shortage can be addressed by organising internal training programmes on ICT accessibility, adding this issue the curricula of university degrees, as well as in the programmes of conferences and in periodicals published by each segment of the industry.

The private sector can help raising policy-makers and civil society organizations’ awareness of existing accessible devices and services. This can be done i.a. through the corporate and product-related communication activities.

Finally, the private sector has a vital role to play regarding the employment of persons with disabilities. By removing attitudinal barriers and making the workplace accessible, employers can greatly contribute to a society where persons with disabilities have a productive and independent life.

The role of Civil Society and Organizations of Persons with Disabilities

Organizations of persons with disabilities and other civil society organizations are essential to promoting coordinated action among persons with disabilities and other citizens. They positively contribute to development efforts as they allow mobilizing social capital and organizing collective action, thus enhancing the interactions between communities and other stakeholders.

Civil society organizations can play a key role in promoting the use of ICTs as an enabler of a disability-inclusive development framework. In particular, they have a tremendous influence in raising policy-makers' awareness of the accessibility barriers that still need to be addressed. This is the first priority identified as part of the consultation (see Table 4.4). In addition, these organizations can contribute to the development of relevant national policies through their involvement in national consultations led by policy makers. Civil society organizations also need to become more active in the work conducted by international standards organizations that are working on these technologies, including consortium-based, voluntary standards, as well as formal standards organizations such as the ITU, the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC), which are open to the participation of civil society. New multi-sectorial and multi-stakeholder partnership mechanisms and initiatives are also encouraged between international organizations such as UNESCO and civil society as it helps to ensure long-term sustainability of initiatives for inclusion of persons with disabilities, maximise participation, and oversee the monitoring and implementation of policies and practices.

Table 4.4 Priority actions for the civil society and organizations of persons with disabilities

CIVIL SOCIETY

Priority actions	Prioritization
Raising policy makers' awareness of accessibility barriers to be addressed	#1
Mainstreaming the use of universal design principle	#2
Getting organizations of persons with disabilities involved in policy making	#3

ORGANIZATIONS OF PERSONS WITH DISABILITIES

Priority actions	Prioritization
Training persons with disabilities to use accessible ICTs	#1
Raising persons with disabilities' awareness of what ICTs can do to facilitate their economic and social inclusion	#2
Getting organizations of persons with disabilities involved in policy making	#3

Source: Authors, based on the results of the ICT consultation

Civil society organizations also have the ability to bring about social progress and economic growth by raising the awareness of persons with disabilities and their parents of what ICTs can do to facilitate their own economic and social inclusion. In addition, these organizations can undertake extensive training of persons with disabilities on the use of these ICT tools. Such training could cover the whole range of potential uses, such as adopting ICTs for basic communications, accessing key public services or using ICTs in a professional context. Lastly, one priority action to be considered by civil society organizations is advocacy for the mainstreaming of the use of the universal design principle in all development efforts. This would contribute to ensuring that the international development framework is disability-inclusive.

The United Nations system and other international organizations

The agencies, programmes and bodies of the United Nations system are playing an important role in the definition of the post-2015 international development agenda. While each member of the family contributes by bringing their own perspective and mandate it is important that the collective delivers as one to incorporate the issue of disabilities into the discussions, identifying the key barriers that need to be addressed and the main opportunities-such as the use of ICTs- that can be leveraged to achieve a post-2015 disability-inclusive development agenda.

In this context, the expert views gathered in the consultation highlight that the most urgent action to be undertaken by the UN system is the implementation of operational activities to meet the disability-inclusive development goals, complemented by the monitoring and evaluation of development efforts at the global, regional and national scales along with the performance review to assess whether development policies, programmes and projects are effective and results-driven (see table 4.5.). In this respect, it is important to ensure that the analysis of results is quantitative and supported by consistent data. It is also important to ensure that analysis of results is designed with the participation of persons with disabilities, in order to make sure that the correct factors are measured. Lastly, the United Nations must ensure that it keeps implementing awareness-raising activities and mobilization campaigns in order to create a demand for national governmental action.

Table 4.5 Priority actions for international organizations

UNITED NATIONS

Priority actions	
Carrying out operational activities to meet the disability-inclusive development goals	#1
Monitoring and evaluating development efforts on the global, reg. and national level	#2
Analysing results to determine whether development policies, programmes and projects are effective	#3
Setting awareness raising and mobilization campaigns to create a demand for action	#4

INTERNATIONAL ORGANIZATIONS

Priority actions	Prioritization
Participating in international standardizations bodies to develop and/or harmonizing accessible ICT standards	#1
Strengthening research and development to develop new ICT-enabled solutions for persons with disabilities	#2
Raising policy makers' awareness of accessibility barriers to be addressed	#3

Source: Authors, based on the results of the ICT consultation

The United Nations system can also take a more active role in identifying and engaging relevant stakeholders to promote collaboration across the broad range of actors that need to be developed for the development of ICT-enabled solutions for persons with disabilities, such as ICT manufacturers, developers, and vendors, creators and distributors whose content can be made accessible in different languages and through all types of ICTs. This is particularly necessary for the development of technical standards, build capacities, share good practices and encourage new partnership mechanisms.

At the community level, it is important that the whole community organizations are trained on how to maximize of the potential of ICTs to improve the social, economic and political participation of persons with disabilities in the community life.

International organizations are another key category of stakeholders, as they also play a special role to providing a neutral platform from which develop and harmonize international standards and provide recommendations related to accessible ICTs. Furthermore, international organizations can contribute to the promotion of research and development focused on developing specific ICT-enabled solutions for persons with disabilities. Lastly, international organizations bear the responsibility to raise policy makers' awareness of accessibility barriers to be addressed.

“It is recognised that the right of accessibility may be in conflict with authorial and other rights and may conflict with the commercial duty to maximise shareholder value; and it may also be that in some jurisdictions corporate social responsibility is subsidiary to maximising shareholder value. It is therefore vital that such issues be resolved through the rational application of economic criteria to determine the appropriate level of economic investment in accessibility by government, commerce and civil society and to determine the degree and nature of transparent regulation and legislation based on the importance of the goods and services and the proportionality of investment to social gain.”

World Blind Union

Box 4.6. A proposal of indicators to measure progress in the use of ICTs to promote the inclusion of persons with disabilities

Defining measurable indicators has proven to be a valid strategy in advancing the implementation of the global development agenda. The consultation has gathered the following set of indicators to support the definition of an action oriented agenda aimed at fulfilling the contribution of ICTs to achieve a disability-inclusive agenda. These preliminary indicators can be further refined by involving relevant stakeholders in each domain and by defining time-bounded goals, to be integrated with the Sustainable Development Goals to be agreed as part of the post-2015 discussions.

GENERAL INDICATORS – access, accessibility and awareness

- * Access to ICTs based on impairment type per technology (telephone, Internet, broadband)
- * Availability of accessible ICT products and services across markets
- * Affordability of ICTs for persons with disabilities
- * Proportion of ICT products and services with built-in accessibility functions
- * Awareness rate of persons with disabilities on the use of ICTs to improve their economic and social inclusion
- * Disability legislation updated with the inclusion of ICT in the definition of accessibility
- * GDP proportion spent on research and development relating to ICT-enabled solutions for persons with disabilities
- * Total of patents filed/awarded to ICT-enabled solutions for persons with disabilities

INDICATORS BY SECTOR

Healthcare

- * Proportion of persons with disabilities accessing healthcare services through ICTs

Primary, secondary and tertiary education

- * Digital literacy rate among schoolteachers and students
- * Availability of accessible ICTs in primary and secondary schools and in universities

Professional and lifelong education

- * Digital literacy rate among persons with disabilities

Employment

- * Digital literacy of employees with disabilities
- * Persons with disabilities employed in the ICT sector
- * Persons with disabilities using ICTs as tool in the workplace

Independent living

- * Proportion of persons with disabilities using ICTs for living independently

Government services

- * Proportion of persons with disabilities accessing e-government services

Participation in political and public life

- * Proportion of persons with disabilities using ICTs to participate in social and political activities

Annex I – Prioritization of main challenges to be addressed to maximize the ICT opportunity for persons with disabilities in each area of development

HEALTHCARE

Challenges	Priority
Cost of assistive technology	13.0 %
Lack of accessibility of ICT devices	10.4%
Limited access to technology	9.1%
Lack of policy implementation and/or lack of effective implementation mechanisms	8.6%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	7.5%
Lack of policies which foster widespread availability of accessible ICTs	7.5%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	7.2%
Policy makers lack awareness of barriers to be addressed	7.0%
Lack of accessibility skills among rehabilitation specialists	6.0%
Lack of digital literacy among persons with disabilities	6.0%
Lack of international standards and guidelines	5.2%
Lack of participation of organizations of persons with disabilities in policy-making	5.2%
Lack of training of information technology professionals	4.7%

PRIMARY EDUCATION

Challenges	Priority
Lack of policy implementation and/or lack of effective implementation mechanisms	10.9%
Limited access to technology	10.4%
Lack of policies which foster widespread availability of accessible ICTs	10.4%
Lack of accessibility of ICT devices	9.3%
Lack of training of information technology professionals	7.2%
Lack of digital literacy among persons with disabilities	5.6%
Policy makers lack awareness of barriers to be addressed	5.3%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	5.1%

Challenges	Priority
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	4.8%
Lack of international standards and guidelines	4.3%
Lack of accessibility skills among rehabilitation specialists	3.7%
Lack of participation of organizations of persons with disabilities in policy-making	3.2%

SECONDARY EDUCATION

Challenges	Priority
Cost of assistive technology	15.2%
Lack of policies which foster widespread availability of accessible ICTs	11.0%
Lack of accessibility of ICT devices	10.5%
Limited access to technology	10.0%
Lack of policy implementation and/or lack of effective implementation mechanisms	8.1%
Lack of training of information technology professionals	7.1%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	6.8%
Policy makers lack awareness of barriers to be addressed	6.8%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	6.0%
Lack of accessibility skills among rehabilitation specialists	4.5%
Lack of participation of organizations of persons with disabilities in policy-making	4.2%
Lack of digital literacy among persons with disabilities	3.7%
Lack of international standards and guidelines	3.2%

TERTIARY, PROFESSIONAL, LIFELONG EDUCATION

Challenges	Priority
Cost of assistive technology	13.4%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	10.1%
Lack of policies which foster widespread availability of accessible ICTs	8.8%

Challenges	Priority
Lack of policy implementation and/or lack of effective implementation mechanisms	8.8%
Lack of training of information technology professionals	8.3%
Limited access to technology	8.0%
Lack of accessibility of ICT devices	7.5%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	7.2%
Lack of digital literacy among persons with disabilities	7.2%
Policy makers lack awareness of barriers to be addressed	6.2%
Lack of participation of organizations of persons with disabilities in policy-making	4.9%
Lack of international standards and guidelines	3.9%
Lack of accessibility skills among rehabilitation specialists	3.6%

EMPLOYMENT

Challenges	Priority
Cost of assistive technology	11.1%
Lack of policies which foster widespread availability of accessible ICTs	11.1%
Lack of policy implementation and/or lack of effective implementation mechanisms	10.0%
Lack of accessibility of ICT devices	9.5%
Limited access to technology	8.7%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	8.7%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	7.1%
Lack of participation of organizations of persons with disabilities in policy-making	6.3%
Lack of digital literacy among persons with disabilities	6.3%
Policy makers lack awareness of barriers to be addressed	5.8%
Lack of training of information technology professionals	5.8%
Lack of international standards and guidelines	5.0%
Lack of accessibility skills among rehabilitation specialists	3.2%

INDEPENDENT LIVING

Challenges	Priority
Cost of assistive technology	21.1%
Limited access to technology	13.0%
Lack of accessibility of ICT devices	10.2%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	9.1%
Lack of accessibility skills among rehabilitation specialists	8.6%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	6.3%
Policy makers lack awareness of barriers to be addressed	6.0%
Lack of policies which foster widespread availability of accessible ICTs	6.0%
Lack of policy implementation and/or lack of effective implementation mechanisms	4.7%
Lack of international standards and guidelines	4.4%
Lack of digital literacy among persons with disabilities	4.2%
Lack of participation of organizations of persons with disabilities in policy-making	3.9%
Lack of training of information technology professionals	2.3%

GOVERNMENT SERVICES

Challenges	Priority
Lack of policy implementation and/or lack of effective implementation mechanisms	14.2%
Policy makers lack awareness of barriers to be addressed	12.9%
Lack of policies which foster widespread availability of accessible ICTs	12.6%
Lack of participation of organizations of persons with disabilities in policy-making	9.0%
Lack of training of information technology professionals	7.9%
Lack of accessibility of ICT devices	7.1%
Cost of assistive technology	6.8%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	6.6%
Lack of international standards and guidelines	6.0%
Limited access to technology	5.0%

Challenges	Priority
Lack of digital literacy among persons with disabilities	4.7%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	4.2%
Lack of accessibility skills among rehabilitation specialists	1.8%

PARTICIPATION IN PUBLIC LIFE

Challenges	Priority
Lack of policies which foster widespread availability of accessible ICTs	10.9%
Persons with disabilities lack awareness of what ICTs can do to facilitate their socioeconomic inclusion	10.7%
Policy makers lack awareness of barriers to be addressed	10.4%
Lack of digital literacy among persons with disabilities	9.9%
Lack of policy implementation and/or lack of effective implementation mechanisms	9.4%
Lack of accessibility of ICT devices	8.6%
Limited access to technology	8.3%
Cost of assistive technology	8.3%
Lack of participation of organizations of persons with disabilities in policy-making	7.6%
Lack of international standards and guidelines	5.0%
ICT vendors lack awareness of persons with disabilities' needs and market opportunities	5.0%
Lack of training of information technology professionals	3.1%
Lack of accessibility skills among rehabilitation specialists	2.1%

Source: Authors, based on the results of the ICT consultation

Annex II – Table data for Venn diagram Figure 4.2

Countries that include ICT accessibility in their national broadband plans

This table shows countries that include policy language on ICT accessibility in their national broadband plans, what type of language it is and also that country's status on the CRPD.

	Countries that have policy language both on A: increasing accessibility of ICTs for persons with disabilities and B: utilizing ICTs to increase accessibility of other services and promote social inclusion	Countries that have broadband plans with only policy language on A: increasing accessibility for persons with disabilities	Countries that have broadband plans with only policy language on B: increasing accessibility for persons with disabilities
Listed countries that have both signed and ratified the CRPD	Barbados, Belize, Denmark, France, Korea, Malta, Mauritius, Poland , Slovenia	Costa Rica, Croatia, Cyprus, Egypt, Estonia, Mexico, Philippines, Sweden, Turkey	Algeria, Australia, Dominican Republic, Jamaica, Macedonia, Tanzania, United Kingdom
Listed countries that have signed the CRPD	Iceland, Japan, USA	Grenada, Ireland	Chad, Singapore, Sri Lanka
Listed countries that have not signed the CRPD	Zimbabwe	Columbia, Liechtenstein, St. Kitts and Nevis, Switzerland	

Annex III – List of organizations involved

This paper has gathered the experiences, views, recommendations and proposals from the following organizations, which took part in the ICT consultation in support of the HLMDD (organizations listed alphabetically by name).

ABC, Mexico
Ability Net, UK
ADD International, Sudan
Agency for Disabled People, Bulgaria
Accessible Media Inc. (AMI), Canada
Asociación Nicaragüense para la Integración Comunitaria (ASNIC), Nicaragua
Aspire, UK
Assistive Technology Association, USA
Association for Progressive Communications (APC)
Austrian Association of the Blind, Austria
BAPU Trust for research on mind and discourse, India
Barbados, (Telecommunications Unit of the Government of)
Bauman Moscow State Technical University, USA
Best Buddies, Mexico
Blackberry, Canada
Bogo City (Government of), Philippines
Bolivia (Viceministerio de Telecomunicaciones)
Bulgarian Paralympic Association, Bulgaria
Center for Ambient Intelligence and Accessibility of Catalonia (CAIAC), Spain
Communication, Access, Literacy, Learning (CALL), Scotland
Captioning International
Captioning Working Group, New Zealand
[Centre for Development of Advanced Computing \(C-DAC\)](#), India
Cedat85, Italy
Centro d'Ateneo per la disabilita' e l'integrazione, Research & Service Center about Disability, Università di Padova, Italy
Center for Accessible Information, USA
Center for the Deaf and Hard of Hearing – BMSTU, USA
Conseil Français des Personnes Handicapés pour les questions Européennes (CFHE), France
China Handicap Fund, China
[Centre for Internet and Society \(CIS\)](#), India
Code Factory, Spain
Coordinadora Nacional de Organizaciones de Limitados Visuales (CONALIVI), Colombia
Creative Centre Trust, Cook Islands
Centro de Vida Independente (CVI), Brazil
Dipartimento di salute della donna e del bambino, Università di Padova, Italy
Diplomatt, Kenya
Diverse Disability Media, USA
DIY Ability, USA
EcoSynergy Group, New Zealand
[European Federation of Hard of Hearing \(EFHOH\)](#)
Egypt (government of)
[European Hearing Instrument Manufacturers Association](#) (EHIMA)
Enabling Unit, India
Estudiantes o Trabajadores Ciegos y Debiles Visuales del Estado de Veracruz, A.C. (ETCDVEV), Mexico
European Agency for Development
FATH, Tunisia
[Federal Communications Commission \(FCC\)](#), USA
ITU Focus Group on Audiovisual Media Accessibility (FG-AVA)
Fundación ONCE, Spain
Friends of the Disabled Association, Lebanon
Future Hope, Ghana
IBM, UK
[International Center for Disability Resources on the Internet \(ICDRI\)](#)
International Federation of Hard of Hearing (IFHOH)
Institut Méditerranée du Littoral, France
Institute on Advanced Communication Studies, Brazil
Instituto Superiore della Comunicazioni e delle Techologie, Italy
Internet Society, Kenya
Internet Society, Pacific Region
Informatici Senza Frontiere, Computer Scientists with no borders, Italy
L'Institut supérieur des études technologiques en communications de Tunis (ISET'Com), Tunisia
Disability Center and Hospital of Padua's University, Italy
Ivory Coast (E-HANDICAP Project of the Government of)
Kenya College of Accountancy (KCA), Kenya
Kenyatta University, Kenya
[Geneva-Kurisasi Market Intelligence Lab](#), Switzerland
Lithuania (Ministry of Social Security and Labour of)
Lucy Tech, Switzerland
Mada (Qatar Assistive Technology Center), Qatar
Makaia, Colombia
Uganda (Meteorological Department of the government of)
Mobinil, Egypt
Monash University, South Africa
National Agricultural Research Organisation Uganda (NARO), Uganda
National Confederation of Disabled People, Greece

National Institute of Speech and Hearing, Egypt
[National Council for the Blind of Ireland](#) (NCBI),
Ireland
Neil Squire Society, Canada
**Norway Post and Telecommunications
Authority**, Norway
Oman (**[Information Technology Authority](#)** og the
government of)
Osers, USA
Paris City Council, France
Polytechnic Institute of Ecuador, Ecuador
**University de Trás-os-Montes e Alto Douro
(UTAD)**, Portugal
Global Wire Associates (GWA), USA
Raising The Floor
Real Time Reporting, Italy
**Samarthyam National Center for Accessible
Environments**, India
SAMENA **[Telecommunications Council](#)**, India
**Saudi Arabia (Universal Access for Individuals
with Disabilities Program)**
ITU-R Study Group 1 - Spectrum management
ITU-R Study Group 4 - Satellite services
**ITU-R Study Group 5A - Land mobile service
above 30 MHz*(excluding IMT); wireless access
in the fixed service; amateur and amateur-
satellite services**
ITU-R Study Group 6 - Broadcasting service

[Support Center for Inclusive Higher Education](#)
(SIHO), Belgium
**Special Educational Solutions Special
Educational Systems**, Cyprus
Telecentre.org Foundation, Asia Pacific &
Thailand
Telecentre.org Foundation, Arab Region
Telefonica, Spain
Telekom, Austria
Institute of Disabilities at the Temple University,
USA
**Texas (Information Department of the
government of)**
Tunis University, Tunisia
Tunisian Association of E-Accessibility, Tunisia
USA (US Department of State)
Ukraine (Inclusive Libraries Project)
United Nations Children's Fund (UNICEF)
Unión Latino-Americana de Ciegos
University of Macerata, Master in Accessibility to
Media, Arts and Culture, Italy
University of Maribor, Slovenia
Vision Sense, UK
What Sock, USA
World Blind Union
[World Intellectual Property Organization](#) (WIPO)
WK Media, Kenya
World Federation of the Deaf

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ANNEX IV - Endnotes

i Further information is available at the [official website](http://www.un.org/disabilities/) of the Secretariat for the Convention on the Rights of Persons with Disabilities (www.un.org/disabilities/).

ii As of June 2013.

iii Further information about the MDGs is available at the [UN MDG website](http://www.un.org/millenniumgoals) (www.un.org/millenniumgoals).

iv

ITU's Telecommunication Development Sector (ITU-D) fosters international cooperation and solidarity in the delivery of technical assistance and in the creation, development and improvement of telecommunication/ICT equipment and networks in developing countries. ITU-D implements projects under the United Nations development system or other funding arrangements, so as to facilitate and enhance telecommunication/ICT development by offering, organizing and coordinating technical cooperation and assistance activities.

v ITU and G3ICT (2012) "Making Mobile Phones and Services Accessible for Persons with Disabilities" August 2012

vi The table below can be read in 2 different ways. First, each line shows the extent to which each technology (websites, mobile device and services, TV set and services, radio, other and emerging technologies) improves persons with disabilities' access to one specific social and/or economic activity. When looking at the columns, they highlight the impact of one specific technology across social and/or economic activities (Healthcare, Primary education, Secondary education, Tertiary, professional, lifelong education, Independent living, Governments services and Participation in political and public life).

vii Detailed examples are available in "Making Mobile Phones and Services Accessible for Persons with Disabilities".

viii The ITU Radiocommunication Sector (ITU-R) plays a vital role in the global management of the radio-frequency spectrum and satellite orbits - limited natural resources which are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, emergency telecommunications, meteorology, global positioning systems, environmental monitoring and communication services - that ensure safety of life on land, at sea and in the skies. Its mission is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including those using satellite orbits, and to carry out studies and approve Recommendations on radiocommunication matters.

ix The Study Groups of ITU's Telecommunication Standardization Sector (ITU-T) assemble experts from around the world to develop international standards known as ITU-T Recommendations which act as defining elements in the global infrastructure of ICTs. ITU-T drives a contribution-led, consensus-based approach to standards development in which all countries and companies, no matter how large or small, are afforded equal rights to influence the development of ITU-T Recommendations.

x AT support is extremely weak in most developing nations as well as in nations with a low Human Development Index ranking.

xi UNESCO (2013). UNESCO Global Report. Opening New Avenue for Empowerment. ICTs to Access Information and Knowledge for Persons with Disabilities. Paris. [See website](http://unesdoc.unesco.org/images/0021/002197/219767e.pdf) (http://unesdoc.unesco.org/images/0021/002197/219767e.pdf).

xii Fifth Quadrant Analytics (2012) "Emerging Giant – Big is not Enough, The Global Economics of Disability", March 1, 2012.