



Telecom Regulatory Authority of India



Recommendations on

Making ICT accessible for Persons with Disabilities

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Chapter I: Introduction

- 1.1 Given the ubiquity of Information and Communication Technology (ICT) services in the world today, it is important that these services are accessible to each and every section of the society. For having an inclusive society it is important that the benefits of the technological advancement be passed on to every person, including persons with disability (PwD). However, PwDs find it difficult to use and avail the advantages of ICT services and equipment, on account of inaccessible features, unaffordable prices of the accessibility equipment or unavailability of required services to make them accessible for use by PwDs.
- 1.2 Accessible ICT can level the playing field for PwDs across various aspects of life and ensure their full participation in areas such as education, employment, e-governance and civic participation, financial inclusion, and disaster management. In a recent survey of 150 experts from over 55 countries, it was found that websites and mobile devices and services can contribute the most to the social and economic inclusion of PwDs. The experts also suggested that the availability and use of ICT by PwDs would have transformative impact on their independent living, chances of employment, education, and access to government services.¹
- 1.3 However, it is pertinent to note that the advancements in technology are insufficient by themselves to bridge the gaps in the socioeconomic inclusion of PwDs. The adaptation and implementation of ICT for inclusive development is considerably dependent upon other factors like knowledge and awareness of the ICT solutions. In fact, if ICT and

1 World Bank, "Bridging the Disability Divide through Digital Technologies - World Development Report", 2016. Available at: <http://pubdocs.worldbank.org/en/123481461249337484/WDR16-BP-Bridging-the-Disability-Divide-through-Digital-Technology-RAJA.pdf>

internet is not designed to be accessible and inclusive its use can even widen the disparities between persons with and without disabilities.

Need for intervention

- 1.4 Typically, ICT laws, policies and regulations do encourage principles of universal access by promoting competition, affordable services, ensuring last mile connectivity, protection of consumers etc. While such measures benefit all users, the needs of PwDs are unique and require a deliberate focus on design and implementation of services. Further, even within the PwD community, different categories of PwDs have varying issues in accessibility. A law or regulation that truly encapsulates universal access has to take into account the different experiences and issues of PwDs while accessing telecommunication and broadcasting services and devices.
- 1.5 Governments, development partners, civil society and disability sector experts are working together to ensure protection of the rights of PwDs by promoting accessibility in public buildings, educational opportunities etc. Internationally, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), adopted in 2006, intended to protect the rights and dignity of PwDs. Widespread adoption of the UNCRPD has resulted in signatory nations adopting a slew of policy measures in order to ensure that the accessibility needs of PwDs are incorporated within the legal and regulatory paradigm. India being one of the earliest signatories of the UNCRPD, enacted the Rights of Persons with Disabilities Act (the RPWD, 2016). This legislation, inter-alia, enumerates various measures that the appropriate government and local authorities should take to enable access to ICT by PwDs.
- 1.6 In the ICT sector private players have contributed considerably by designing and manufacturing aids and assistive devices for PwDs.

However, corresponding developments in the sphere of ICT services or content are yet to come about, particularly in India. For instance, it has been observed that even though accessible set top boxes have been designed for PwDs and are available in the market, there is a lack of accessible content which would support the use of such set top boxes. Similarly, even though content on websites may be machine readable, service providers continue to send utility bills in a format that cannot be accessed by persons with visual impairment. These instances demonstrate that the full benefits of ICT development have not reached PwDs.

- 1.7 Bridging this digital divide for PwDs may require additional investment from private players to develop devices and services which are usable for PwDs. Since the requirements of the products and services which are usable by PwDs are unique and the market to which these will cater is relatively small, the manufacturers and service providers might have to incur additional costs to provide accessible products and services. However, the market participants may not find it profitable to invest in creating such products and services.
- 1.8 In addition to above impediments, there seems to exist an information gap between the providers of ICT products and services and the PwDs. PwDs perhaps are not fully aware of the offerings in market and policies that can enable ICT access for them.
- 1.9 Therefore, the Authority is of the view that additional policy interventions should be explored and implemented to address the unique challenges faced by the PwD community. Accordingly, the Telecom Regulatory Authority of India (the Authority) suo-motu, decided to take up this issue with the objective of identifying key areas where policy interventions are needed, to understand the barriers being faced

by the PwDs in accessing ICT, so that appropriate positive actions are taken at policy level.

1.10 Under section 11(1)(a) (iv) and (v) of the Telecom Regulatory Authority of India Act, 1997, the Authority has been mandated to promote efficiency in the operation of telecommunication services so as to facilitate growth in such services and technological improvements in the services provided by the service providers. The Authority issued a consultation paper (CP) titled “Making ICT Accessible for Persons with Disabilities” on 20th December, 2017 to seek stakeholders view on ways in which ICT accessibility for PwDs can be improved.

1.11 In response, the Authority received 34 comments from stakeholders. These were placed on TRAI's website. An Open House Discussion (OHD) for stakeholders was organized on 5th April, 2018. After carefully going through the comments of the stakeholders and its own analysis, the Authority has prepared these recommendations. Though a lot of steps can be taken to improve the lives of the PWDs, the Authority in these recommendations, suggested steps only within telecommunications areas which includes broadcasting & cable services. Further, these recommendations are for seeking compliance from the stakeholders and fulfillment of the provisions of the RPWD Act,2006.

1.12 The recommendations have three chapters. The chapter-II “Addressing the Challenges for PwDs in accessing telecom and broadcasting services: Analysis and Recommendations” deals with the rationale for intervention and lays down the Authority's recommendations on each issue. The Chapter-III "Summary of recommendations" summarises the recommendations made by the Authority. International practices have been incorporated as and when required during the course of discussion.

Chapter II

Challenges for PwDs in accessing telecom and broadcasting services: Analysis and Recommendations

A. Types of disabilities

- 2.1 The Rights of Persons with Disabilities Act (the RPWD, 2016)' sets out obligations to promote accessibility and defines PwD as “a person with long term physical, mental, intellectual or sensory impairment which, in interaction with barriers, hinders his full and effective participation in society equally with others.”
- 2.2 The International Telecommunication Union (ITU) has identified certain key challenges faced by PwD while accessing telecommunication and broadcasting services and devices and has categorized them broadly on the basis of *Audio impairment, Visual Impairment, Dexterity based disabilities, Cognitive disabilities etc.* The consultation paper on the subject included a number of disabilities and challenges being faced by the PwDs and the stakeholders were asked to list out specific disabilities and other challenges faced by PwDs that have not been included in the consultation paper.
- 2.3 In response to the types of disabilities several stakeholders highlighted that the consultation paper adequately captured relevant disabilities and all 21 disabilities listed under the 'Right of Persons with Disabilities Act, 2016' should be covered under any proposed framework. Many stakeholders also mentioned specifically that cognitive disabilities, learning disabilities, locomotive disabilities, and degenerative diseases should also be incorporated into any proposed framework.

- 2.4 In response to the issue of challenges faced by PwDs, many stakeholders stated that poor literacy, lack of availability in regional languages, and high cost of assistive technology pose major impediments for PwDs. Some stakeholders also highlighted difficulty in access to customer service, marketing information and authentication, identity verification, including biometric authentication such as iris scanning and/or fingerprinting, and non-compliance with international accessibility guidelines by most equipment manufacturers.
- 2.5 Some of the stakeholders demanded that this consultation process be stayed till the time Ministry of Information and broadcasting (MIB) comes out with accessibility standards for television. However this was opposed by the several stakeholders in the open house stating that the consultation process of TRAI is encompassing the work assigned to the committee formed by MIB and therefore the process must continue.

Analysis:

- 2.6 The United Nation Convention on the Rights of Persons with Disabilities (UNCRPD), adopted on 13th December 2006 at the United Nations Headquarters in New York, represents a “paradigm shift” regarding attitudes and approaches to persons with disabilities. The purpose of the Convention is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity. Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.
- 2.7 The Rights Of Persons With Disabilities Act, 2016 (RPwD,2016) identified following disabilities:

- | | | |
|----------------------------|-----------------------------------|--|
| 1. Blindness | 9. Specific Learning Disabilities | 17. Haemophilia |
| 2. Low Vision | | 18. Sickle Cell disease |
| 3. Leprosy Cured persons | 10. Hearing Impairment (Deaf) | 19. Autism Spectrum Disorder |
| 4. Locomotor Disability | 11. Hard of Hearing | 20. Chronic Neurological conditions |
| 5. Dwarfism | 12. Muscular Dystrophy | 21. Multiple Disabilities including Deaf Blindness |
| 6. Intellectual Disability | 13. Acid Attack Victim | |
| 7. Mental Illness | 14. Parkinson's disease | |
| 8. Cerebral Palsy | 15. Multiple Sclerosis | |
| | 16. Thalassemia | |

2.8 The above categories would require special attention in terms of care and assistance and using ICT equipment. The "Specified Disability" as laid down in the Schedule of the RPwD Act, 2016 comprehensively covers most of the disabilities presently prevalent. During the consultation process most of the stakeholders conveyed that above list under RPWD, Act 2016 is comprehensive and does not require any modification. The disabilities mentioned in the comments of some of the stakeholders and all the disabilities specified by the ITU are already covered in the above list. Therefore, the Authority agrees with the views of the stakeholders and not defining specific disabilities for formulating policies enabling ICT access for PwDs.

2.9 **In view of the above, the Authority recommends that the types of disabilities, as specified in the RPwD Act, 2016 are comprehensive and do not require modification for the purpose of formulating policies enabling ICT access for PwDs.**

2.10 As mentioned by the stakeholders during the consultation process, there are several challenges viz high cost of assistive technologies, difficulty in access to customer service, marketing information and authentication, identity verification, including biometric authentication and non-compliance with international accessibility guidelines by most

equipment manufacturers etc. are some of the issues which need focused attention of the governments, govt agencies, service providers and equipment manufacturers etc. These challenges have been discussed in the subsequent paras and remedial measures have been suggested.

B. Reasons for policy benefits not reaching PwDs

2.11 The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), adopted in 2006, intended to protect the rights and dignity of PwDs. Article 9 of the UNCRPD states that PwDs have the right to enjoy equal access to the physical and digital environments and transportation in rural and urban areas. Therefore, the UNCRPD categorically mandates ICT accessibility for the PwDs.

2.12 The widespread adoption of the UNCRPD has resulted in signatory nations adopting a slew of policy measures in order to ensure that the accessibility needs of PwDs are incorporated within the legal and regulatory paradigm. Many member countries have taken a number of measures to ensure accessibility of telecommunications and broadcasting services for PwDs as well. It is pertinent to note that India is one of the earliest signatories of the UNCRPD when it signed the convention in October 2007. In order to give effect to the principles for empowerment of persons with disabilities that were laid down by the UNCRPD, in 2016 the Government enacted the Rights of Persons with Disabilities Act (the RPWD, 2016). This legislation, inter-alia, enumerates various measures that the appropriate government and local authorities should take to enable access to ICT by PwDs. For ICT based services and

equipment, the legislation imposes the following obligations on the appropriate government in this regard:²

- To take measures to ensure that all content available in audio, print and electronic media are in accessible format;
- To ensure that PwDs have access to electronic media by providing audio description, sign language interpretation and close captioning;
- To ensure that electronic goods and equipment which are meant for everyday use are available in universal design;
- To take measures to promote development, production and distribution of universally designed consumer products and accessories for general use for PwDs.

2.13 The International Telecommunication Union (ITU) has also identified certain measures viz. *Availability and affordability of accessible equipment, Access to assistive technologies, Products and tariff plans, Accessible services and interfaces, Accessible customer services etc* that can be taken to address the challenges faced by PwDs.

2.14 The Authority is seriously concerned that despite RPWD Act,2016 in place and several other measures taken by the governments and international organisations, the desired benefits of policies has not been fully percolated to the affected people. Accordingly, in the CP the stakeholders were asked to highlight reasons as to why the desired benefits of ICT are not reaching the PwDs. Further, the stakeholders were asked to suggest additional measures besides those taken by the government(s) and as suggested by ITU. Stakeholders were also requested to comment whether the Government/TRAI should direct the

² The National Policy on Universal Electronic Accessibility, available at: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=99845>.

telecom and broadcasting service providers to provide information pertaining to billing, usage, pricing and contracts in the form accessible to PwDs.

2.15 In response, most stakeholders mentioned lack of awareness, affordability and lack of policy enforcement and monitoring as the main reasons for benefits of policy measures not reaching PwDs. Few responses also pointed to issues such as lack of coordination between government and other stakeholders, non-inclusion of PwDs in policy formulations, and absence of training for PwDs.

2.16 On the issue of additional measures to improve ICT accessibility for PwDs, as mentioned earlier, most stakeholders highlighted measures such as provision of assistive technologies, relay services, orientation and training required regarding ICT and accessible broadcast content. Some stakeholders suggested that investment in research is required to devise and enhance technological solutions such as Bluetooth, motion commands, voice assistance, artificial intelligence, machine learning, and virtual reality that can be utilised to address challenges faced by PwDs. Quite a few stakeholders highlighted need to come up with mobile handsets that can be made accessible to persons with different disabilities by integrating a variety of features in the hardware design and operating system, and providing specific services as well as by installing third party applications. Few stakeholders also highlighted the need for trained customer service personnel for assistance to PwDs.

Analysis

2.17 As discussed earlier that there is law existing in India in the form of RPWD Act, 2016. During the OHD also the participants also pointed out that despite RPWD,2016 Act no substantial progress is made on the ground regarding ICT accessibility for the PwDs. Though lot of progress

has been made on development of technologies in terms of smart phones, landline phones, Set Top boxes etc world wide but in India these benefits have not reached fully to the PwDs. This is due to the lack of coordination among various departments responsible for implementation of various policies and programmes including those for PwDs. Therefore, in order to provide thrust for implementation of policies and programmes the Authority is of the view that there is a need to constitute an inter-ministerial steering committee with a specific focus on suggesting measures to the Government and other stakeholders, as laid down in the RPwD Act, 2016. From time to time this committee should review whether the ICT benefits are reaching to the PwDs, suggest additional measures required to be taken by the Govt including funding requirements, formulate guidelines and suggest a monitoring and implementation mechanism to improve ICT accessibility for PwDs. As the Department of empowerment of PwD is the nodal agency for formulation and implementation of programmes, the inter-ministerial committee should be formed under the aegis of this department. Other relevant departments should be Department of Telecom, Department of Electronics and IT (DeitY), Concerned Departments under Ministry of Corporate Affairs and Ministry of Finance. The steering committee should collaborate with state governments for proper coordination and harmonise the activities to be undertaken.

2.18 Accordingly, **the Authority recommends that in order to ensure accessibility of ICT services to the PwDs a steering committee under aegis of Department of Empowerment of Persons with Disabilities should be formed. Other members in the committee should be from DoT, MIB, MeitY, Ministry of Corporate Affairs and Ministry of Finance. The Terms of Reference for the committee should be to:**

- (a) review from time to time whether the ICT benefits as envisaged in the RPWD Act,2016 are reaching to the PwDs;**
- (b) suggest additional measures required to be taken by the Govt including funding requirements and mechanism;**
- (c) formulate guidelines and suggest an implementation and monitoring mechanism so as to improve ICT accessibility for PwDs;**
- (d) collaborate with state governments for proper coordination and harmonise the activities to be undertaken.**

2.19 On the issue of measures taken by the ITU it is pertinent to note that it has identified certain measures to address the ICT challenges for PwDs. They are as follows:

- *Availability and affordability of accessible equipment:* Accessible ICT i.e. access to end-user equipment, such as mobile handsets, televisions, tablets and computers, offer features to enable persons with disabilities to use ICTs effectively needs to be made available in the market and to ensure that such devices are affordable.
- *Access to assistive technologies:* In order to ensure barrier free interaction with the digital world, it is essential that assistive technologies are free or available at a low cost through subsidies or grants. It is imperative to either make devices accessible or ensure that devices are compatible with third party assistive technologies. There is also a need for training of PwDs and those who assist them on the use of technologies and features made available.
- *Products and tariff plans:* Products and tariff plans offered by TSPs may be structured in a way that recognize the ways that PwDs use services – for example, TSPs should consider offering subsidized text-only mobile communications packages for deaf or hearing-impaired users.

- *Accessible services and interfaces:* To ensure complete and equal participation in the digital world, PwDs require services and interfaces that ensure that content on television, Internet or in other electronic media is available in accessible formats – for instance, through the use of closed captions for users who are deaf or hard of hearing and audio description for users who are blind or visually impaired. There is also need to undertake awareness campaigns on the availability of accessible content.
- *Inaccessible customer services:* PwDs face challenges accessing customer services offered by telecom service providers. Customer services need to be redesigned to address the specific needs of persons with disabilities.³

2.20 During the consultation process a number of stakeholders opined that if measures suggested by ITU are adopted in India too, it will bring a substantial change in the ICT accessibility. The Authority concurs with the view of the stakeholders that the suggested measures to address the ICT challenges for PwDs should be adopted in India too. The Authority in these recommendations is recommending some specific measures which are aligned with the ITU's suggestions.

2.21 Accordingly, **the Authority recommends that the suggested measures by ITU to address the ICT challenges for PwDs should be adopted in India.**

2.22 On accessibility of devices and services various countries have taken measures. In the United States, Section 255 of the Communications Act of 1934 (as amended), requires telecommunications products and

³ International Telecommunications Union, Model ICT Accessibility Policy Report (2014), available at <http://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Documents/ICT%20Accessibility%20Policy%20Report.pdf>.

services to be accessible to PwDs. Under this law, Federal Communication Commission's(FCC) implementing regulations, telecommunications and interconnected voice over Internet protocol (VoIP), service providers and equipment manufacturers must make their services and equipment accessible to and usable by individuals with disabilities, if readily achievable⁴. In this reference it is pertinent to understand the following terms:

- a. **Accessible:** A product or service is deemed accessible if it provides accessible input, control and mechanical functions, as well as accessible output, display and control functions. For example, a mobile phone that has both audio and visual controls for inputting information, as well as both audio and visual methods for retrieving messages, would be accessible to a person who is blind or deaf.
- b. **Usable:** For a product or service to be usable, people with disabilities must be able to learn about and operate the product's or service's features effectively. This requirement includes providing access to information and documentation for the product or service, including instructions and user guides. In addition, companies must provide functionally equivalent access to support services, such as technical support hotlines and databases, call centers, service centers, repair services and billing services.
- c. **Compatible:** Wherever accessibility is not readily achievable, a product or service must be made compatible with peripheral devices or specialized equipment. Peripheral devices are devices

4 Available at <https://www.fcc.gov> › For Consumers › Consumer Guides.

that help make telecommunications products and services accessible to individuals with disabilities. Examples external electronic access to all information and control mechanisms, visual signaling devices and amplifiers, a connection point for external audio processing devices etc

- d. **Readily Achievable:** requires companies to incorporate access features that are easily accomplishable without much difficulty or expense. In determining the readily achievability, companies need to balance the costs and nature of the access required with their available resources. Companies that have great resources will need to do more to achieve access than companies with smaller budgets.

2.23 There are other laws viz. The Hearing Aid Compatibility Act which requires the FCC to ensure all wireline telephones manufactured or imported for use in the US and all "essential" telephones, such as public phones, emergency phones and workplace phones, are hearing-aid compatible. Digital wireless phones were also covered under FCC rules since 2003. The Telecommunications Relay Service (TRS) allows persons with hearing or speech disabilities to place and receive telephone calls. In US, TRS is available in all 50 states, for local and/or long-distance calls. TRS facility is generally provided free of cost to all users by the TSPs. TRS providers are compensated for the costs of providing TRS from either a state or a federal fund.

2.24 There are several types of TRSs available to users depending upon the needs and the equipment available. Examples include: Text-to-Voice, Text Tele-typewriter-based TRS which is a device used for transmitting typed text conversation over telephone lines for those who cannot use

spoken conversation. Other examples include speech-to-speech relay service, captioned telephone service etc.⁵

2.25 In Canada, accessibility of telecommunication services is part of the broader regulatory policy governing the sector and comes under the regulatory jurisdiction of the Canadian Radio-television and Telecommunications Commission (CRTC). Under its Broadcasting and Telecom Regulatory Policy 2009-430, there was an extension of relay services to include IP relay service and the policy also made it obligatory for service providers to provide at least one type of wireless mobile handset which accommodates the needs of PwDs, provide alternative billing formats and include accessible disability-specific information on websites⁶ .

2.26 In France, the Telecom regulator ARCEP (Autorité de Régulation des Communications Électroniques et des Postes) has organised stakeholder consultations with operators, representative organisations and institutions in order to establish criteria for identifying accessible devices. This set of criteria has been shared with the mobile manufacturers' forum in order to integrate them in GARI⁷ (Global Accessibility Reporting Initiative) database. GARI is an online database for accessible mobile phones, tablets and apps. It allows consumers to learn about accessibility features of mobile devices. In its annual reporting system, each operator has to share the information with ARCEP regarding the number of accessible devices provided by them.

5 FCC, Telecommunications Access for People with Disabilities, Available at: <https://bit.ly/1N80Zsa>

6 Joint report by ITU and G3ict on 'Making mobile phones and services accessible for persons with disabilities', available at: <https://bit.ly/2vYmMSf>

7 <https://www.gari.info>

2.27 Further, private telecommunication companies and manufacturers are also exploring solutions to provide accessible ICT services and devices to PwDs. Certain TSPs provide special tariff plans for the hearing impaired so that they pay only for messaging and not for voice calls. In addition to “text only” plans, some TSPs are also offering “text and data” plans without voice as in other bundled options. This allows persons with hearing impairment to benefit from tailored payment plans for mobile data services.

2.28 In the US, T-Mobile has come up with a “data only” plan that offers the freedom to pay only for text and not for call minutes. Similarly, AT&T has also launched its own Text Accessibility Plan (TAP) for select smart phones as well as feature phones.⁸

2.29 In India, RPWD Act,2016 envisaged that there is need to take measures to ensure that all content available in audio, print and electronic media are in accessible format. So far as ICT accessibility is concerned the Authority is of the view that the telecom service providers need to provide telephone/DTH bills to the PwDs in accessible form based on their choice. For the persons with low vision, telephone/mobile bills can be provided in large font size, blind persons can opt to get the telephone bill in Braille script. The TSPs need to seek option from the subscriber(s) in this regard. Once option is obtained, the TSPs will be required to send printed bill in the accessible format. Those subscribers who demand bill in electronic format need to provide the same on email ID of the subscriber in large fonts and in machine readable form so that persons with hearing disability can listen to the contents of the bills. In no case telephone/mobile/broadband bills are to be send in picture format

8 Joint report by ITU and G3ict on ‘Making mobile phones and services accessible for persons with disabilities’, available at: <https://bit.ly/2vYmMSf>

(jpg,png etc). During the consultation process, on the issue whether Government/TRAI should direct the telecom and broadcasting service providers to provide information pertaining to billing, usage, pricing and contracts in a form accessible to PwDs, a majority of the stakeholders responded in the affirmative to this question.

2.30 It is pertinent to note that the Authority in its regulations viz. mandated that the service providers will give bills for telecom services to the subscribers(post-paid in case of mobile and for landline telephones). Looking at the need of the PwDs there is a need to modify/amend these regulations so that the PWDs can get bills in the accessible format. The Authority envisages a framework in which a subscriber having disability can opt for information to be provided in a particular format suitable for him. Such subscribers should be able to opt for this service at any point during the course of his/her contract with the service provider. Accordingly, **the Authority will carry out necessary changes in its regulation(s)/direction(s)/TTOs to provide for a framework wherein a subscriber in PwD category can opt for his/her utility bill in a particular format at any point of time. Though tariff in India is under forbearance, the Authority would like that TSPs should consider offering subsidized text-only mobile communications packages for deaf or hearing-impaired users/subscribers.**

C. Mobile applications for PWDs

2.31 With the advent of smart phone the daily life of user has become simpler as they assist in many ways e.g. by use of GPS, calculator, alert & alarm etc. With mobile internet connectivity and development of millions of mobile applications has made life even more convenient. For assistance of PwDs there are several mobile apps viz. 'Be My Eyes' app for helping visually impaired travelers, 'Dragon Dictator' app for Communication for

the hearing-impaired persons, 'Assistive Touch mobile' app offers virtual buttons that allow users to navigate a device without actually having to touch it, 'JABtalk' app for Communication for nonverbal adults and kids etc. Though most of the mobile apps may work on popular mobile operating system viz iOS, Android or windows etc however it is possible that some of the device manufacturers customize their systems which do not allow mobile applications on certain platforms. Accordingly, in order to control such customisation stakeholders views were sought in this Consultation Paper.

2.32 In response to the CP, many respondents suggested that device manufacturers should be mandated to allow in their device's operating system those applications which are meant to assist PwDs. An argument put forth is that private players do not cater to the needs of PwDs. There is limited investment in research and development of applications pertaining to PwDs. So, it is suggested that mandating applications assisting PwDs on devices will lead to greater availability of these applications and consequently to a decrease in prices for users. One of the stakeholders suggested that Ministry of Electronics and Information Technology (MeitY) may consider fostering cooperation among Indian IT vendors and operators for the development of various types of interfaces for PwDs leveraging artificial intelligence. This will allow devices to automatically adjust their accessibility features to the user profile while offering to automatically download relevant assistive apps residing on vendors' or operators' app stores. Further, TRAI/MeitY/DoT-MoC may facilitate the development of solutions to ensure unrestricted access to app stores by PwDs seeking to download assistive apps.

Analysis

2.33 The mobile apps are becoming very popular due to their utility to make life easier and convenient. Worldwide there are three major mobile operating system platforms — Apple's **iOS**, Google's **Android** and Microsoft's **Windows** Phone — all include tools and features to help users with low or impaired vision, as well as those with hearing or motor-skills issues. For example iOS includes features like invert or filter screen colors, or use the device's camera and flash as an illuminated digital magnifying glass with the Magnifier feature. Feature like 'Voice-over-feature' audibly describes what is on the screen and can be controlled with touch-screen gestures or a Braille display. The voice-activated 'Siri' assistant can handle voice commands and control certain apps and Zoom function, controls for making the onscreen text bigger. Some of these features are available in Android version too. In addition, it has features like 'TalkBack' to interact with device using touch and spoken feedback, Select to Speak to select items on device screen to hear them read or described aloud. Switch Access for users with limited mobility, for using the touch screen. Voice Access for easy access to touch screen, opening and closing Apps. Using feature like BrailleBack one can connect a refreshable braille display to the mobile device via Bluetooth. Apart from above there can be variant in terms of Display size, font size, Magnification gestures: contrast and color options and close caption etc. In Windows platform accessible features are adjust text size and color, screen-reading narrator, color filters to customise screen's color palette etc

2.34 There are several apps available for mobile which can work as assistive technology for the PwDs. Their utility needs to be fully exploited to make life easy for the PwDs. It is observed that in order to cut cost of the mobile devices some of the device manufacturers/importers prefer to

compromise on accessibility features available on these platforms. As a result, lot of application developers are not able to develop and run mobile applications in such compromised platforms. The Authority is of the opinion that Govt should mandate the device manufacturers/importers not to curtail the accessibility features available at popular Operating Systems in any manner from their devices. An undertaking of this effect may be taken from them.

2.35 In view of the above, **the Authority recommends that the Government should mandate the device manufacturers/importers not to curtail the accessibility features available in popular operating systems in any manner from their devices (manufactured or imported in India). An undertaking to this effect may be taken from them when their device models come for certification in the Government approved labs.**

D. Accessibility of customer support services

2.36 There are challenges for PwDs to contact customer care/support centres of the telecom and broadcasting service providers. It is due to the fact that at the call centres/customer care centres there are hardly any trained executive(s) who can understand/takedown their grievance(s) related to deficient telecom/broadcasting services. In many countries the telecom service providers have made special provisions at their customer care centres to receive calls/SMS from the PwDs. Similarly, they have websites which are in accessible format for the PwDs.

2.37 PwDs are especially vulnerable in the event of emergencies. It becomes particularly difficult for PwDs to contact their acquaintances or directly with emergency services during emergency situations. ICT plays pivotal role in connecting people to information, people to rescue workers and

resources, and people to people during emergencies, aftermath and during recovery.

2.38 UNCRPD requires that the State parties should take appropriate measures for the PwDs for ICT accessibility. Article 9 of the Convention specifically extends the obligation to provide accessible information and communication services to include emergency services. In a survey conducted by The Body of European Regulators for Electronic Communications (BEREC), out of 28 respondent National Regulatory Authorities (NRAs), 21 indicated that there are specific measures in their respective countries to ensure access to emergency services for PwDs⁹. In France articles D.98-8-1 to D.98-8-6 of the French Electronic Communication Code outline the functioning of the service, which consists of a relay center dedicated to requests coming from deaf and speech-impaired end-users, receives and dispatches them the relevant public service.

2.39 In the CP, the stakeholders were asked to suggest measures that can be taken in India so that emergency services are made more accessible for PwDs and whether suggested measures are made mandatory to implement by the TSPs. In response, most stakeholders agreed that implementation of emergency measures by TSPs should be made mandatory. Some stakeholders favoured a multi-stakeholders approach to creation of a common emergency interface and standards which may facilitate emergency access for PwDs. Other stakeholders pointed out that a single emergency number can be allocated that allows PwDs to communicate with each other as well as directly with emergency services using alternative means of communication including texting and making emergency information available in accessible format.

⁹ BEREC, "Report on NRAs' practices for ensuring equivalence of access and choice for disabled end-users", March 2018. Available at:

Analysis

- 2.40 There is no doubt that PwD customers of TSPs require dedicated customer support services with trained personnel to take full advantage of these new features. Internationally, there are some operators viz. NTT DoCoMo, Orange or AT&T Wireless which are providing various forms of dedicated support to the PwD customers. While dedicated point of sales and service have come up in Europe and Japan, most operators around the world do not have such facilities. In terms of websites, there are several device manufacturers viz Apple, Motorola, Samsung, and telecom service providers viz. AT&T wireless, Orange, Sprint, T-Mobile, Verizon whose websites are in accessible format.
- 2.41 So far as emergency services are concerned PwDs should be able to use their everyday ICT devices and services for availing emergency services. SMS based services, mobile applications and text relay are some of the ways in which emergency services are provided to the PwDs.
- 2.42 In Australia, the Government has mandated emergency access via SMS. For people who are Deaf, hearing impaired or speech impaired, there are two ways to contact emergency services from a mobile through the facilitation of an intermediary, a relay officer from the National Relay Service (NRS). (a) Speak and Listen (for people with speech impairment only; they must have speech, or a speech output device, which can be understood by a relay officer) (b) Internet relay from a limited number of smartphone devices. In addition, there is mobile emergency app using which PwD can make emergency call via National Relay Service(NRS).
- 2.43 In India, the Authority in its recommendations titled “Integrated Emergency Communication and Response System (IECRS)” dated 7th

April, 2015 recommended to allow (a) SMS based access to IECRS; (b) location information in the case of SMS based access to IECRS by TSPs. Implementation of these IECRS recommendations will help some category of PwDs too. In the same recommendations the Authority recommended a Public Safety Answering Point (PSAP) based system wherein emergency call is attended by the persons at a call centre named PSAP. Though the framework recommended by the Authority has been accepted by the Government and instructions have been issued for its implementation, it is yet to see light of the day.

2.44 The Authority is of the view that every service provider (TSPs/MSO/DTH) should have dedicated customer support desk meant only for PwDs so that any call received from them should be directed/diverted to that desk. In order to ensure that the call is received at the dedicated desk/position in the customer support centre, the TSPs while registering PwDs as customers for mobile/landline services should assign a separate category to such numbers. Whenever call is received in the customer support centre, based on its Calling-Line-Identification (CLI) and special category the same will be routed to the dedicated desk. The dedicated desk should consist of a relay center dedicated to requests coming from deaf and speech-impaired end-users. Similar arrangement made in PSAP where emergency calls will be received once IECRS system is put in place.

2.45 Apart from having a dedicated desk it is also important to ensure that the customer support/service staff employed by TSPs and broadcasters are adequately trained to assist PwDs in accessing the services and devices designed for them. ITU's model ICT accessibility policy report highlights the need from private members of the ecosystem to train their staff on assisting PwDs and instill awareness of all available accessible ICT features for people with different kinds of disabilities including

physical setup and use of assistive technologies as well. The report also recommends that license conditions should mandate service providers to ensure that concerned personnel should be given such training from time to time.¹⁰ The Code for People with Disabilities Regulations issued by the Independent Communications Authority of South Africa also mandates that licensees should ensure that there are trained employees who can provide customer service and communicate with PwDs in their stores.¹¹

2.46 In view of the forgoing discussion **the Authority recommends that:**

(a) All TSPs should identify existing mobile/landline numbers of their customers who are eligible to be classified under PwD. Provision should be made in the Customer Acquisition Form (CAF) for registering new customers as ‘PwD’ in case he/she is a PwD. All such numbers should be assigned a special category.

(b) TSPs, MSOs and DTH Operators should have a special desk in their Call Centres/Customer support centres where calls received from special category numbers are routed to this specialised desk which should be manned by person(s) to receive calls from PwDs using assistive technologies.

(c) While implementing the ‘Integrated Emergency Communication and Response System’ (IECRS) Recommendations of the Authority, the Government should make provision for a special desk in each of the Public Safety Answering Point (PSAP) where the attendant executive should accept the calls/SMSs/social

10 Ibid.

11 The Independent Communications Authority of South Africa, Code for People with Disabilities, available at: https://www.ellipsis.co.za/wp-content/uploads/2014/07/38211_gen1007.pdf

media calls/SMSs from PwDs and provide them immediate assistance. This desk should have a relay center dedicated to requests coming from deaf and speech-impaired end-users. A call received from such numbers (having a defined category) should be routed to the specialised desk so that PwDs in emergency can be provided immediate assistance.

(d) TSPs, MSOs/DTH and PSAP operators should ensure that the executives that deal with PwD customers have been given sensitivity training from time to time so as to understand and deal with the issue raised by PwDs.

E. Awareness and training

2.47 In order to sensitize the need of PwDs and to bring attitudinal changes in the society towards them, awareness generation about accessibility tools to PwD is utmost important. This can be done through designing of effective campaigns throughout the country. Accordingly, in the CP, the stakeholders were asked about how effective campaigns be designed to create awareness about use of ICT accessibility tools. It was also asked whether such campaigns be funded by CSR funds, If not, what other mechanisms can be used to fund such campaigns?

2.48 In response, most of the stakeholders agreed that campaigns can be funded by CSR funds. Apart from it, Government funding was also suggested by some stakeholders. Following are some steps suggested by the stakeholders for effective campaigns:

- Empower consumer organisations: Partner with different stakeholders in execution of its projects, such as NGOs, service providers, hardware manufacturers, educational and research organizations, government departments and other relevant groups.

- Run pilot projects to connect PwDs in rural and urban areas.
- Campaign must generate awareness about the needs of PwDs and use and importance of ICT for their mainstreaming and protection of rights and making them productive citizens for the nation.
- Government Departments at Union level, State levels and at local/Panchayat levels should be involved.
- People with disabilities should also be involved in the design and implementation of such programs. Workshops shall be organized in Government/ private organizations in order to sensitize officials to respond to the needs of PwDs. Capacity building programs to be organized to build up capacity of trainers and resource centers to train people in using assistive technologies.
- Create detailed accessible manuals of various telecommunication devices deciphering accessibility features.
- The Government can hire specialised agencies to run such campaigns. The broadcasters can also contribute by running these ads on their networks under CSR funding.
- The campaign should be at a very large scale
- The Government's 'Inclusive (Swavlamban) India', 'Accessible India', 'Digital India' and 'Make in India' campaigns should be designed in collaboration with the private sector verticals (eg. Telecom/ICT) to create a sustained and impactful communication and awareness campaign of tools/services available to PwDs.
- Schools and colleges must have curriculum that educates students to be aware of challenges faced by the PwDs.

Analysis

2.49 Ensuring that PwDs can effectively harness the transformative power of ICT requires PwDs and their support networks to be aware of these available assistive technologies and understand their power to alter their lives substantially. This can only happen through comprehensive outreach efforts that inform and educate PwDs and their caregivers about the availability of accessible features on ICT products and services and manner in which they can be operated. During the consultation process as well, a majority of the stakeholders pointed out that the lack of awareness and training is a key reason why policy initiatives to improve access to ICT are not reaching PwDs.

2.50 Countries across the globe are trying to address this issue. For instance, the Code for People with Disabilities Regulations issued by the Independent Communications Authority of South Africa requires licensees to conduct frequent awareness campaigns, which seek to address among other rights of PwDs, issues of accessibility, design, affordability and information on products. It also encourages licensees to collaborate with organisations and associations representing PwDs on awareness programmes.¹² Therefore, the Authority believes that DoT, and the MIB should instruct TSPs and DTH/MSOs to conduct frequent awareness campaigns regarding issues of accessibility, design, affordability and information pertaining to available assistive products. Help of disability rights organisations specialising in designing and implementing awareness campaigns can be taken to launch nationwide public awareness campaigns regarding assistive ICT technologies available to PwDs and the various government policies/schemes pertaining to accessible ICT that can be availed by PwDs.

12 <https://www.icasa.org.za/consumer-publications/code-for-people-with-disabilities>.

2.51 In view of the above, **the Authority recommends that DoT and MIB may instruct TSPs and DTH/MSOs to conduct frequent awareness campaigns regarding issues of accessibility, design, affordability and information pertaining to assistive products available to PwDs and the various government policies/schemes pertaining to accessible ICT that can be availed by PwDs;**

Accessible Devices

2.52 On the issue of accessibility of devices for PwDs, most of the respondents were in agreement that at least one mobile handset model should be made available by mobile device manufacturers which are accessible to PwDs. However, some of the respondents disagreed with this proposition. It was suggested by one of the respondents that universal design principles should be adopted instead of developing a model specifically for PwDs. If specific models are designed for PwDs, there may be potential issues of interoperability with software programs/applications that are constantly being developed or issues of upgradation of such models. Some of them suggested that not just one but all the handsets by the device manufacturers should be made accessible for PwDs. It was argued that if handset manufacturers make one special handset for the disabled, they may use this as the basis to argue that they should not be required to make all handsets accessible, as the one special handset constitutes sufficient compliance with their obligation to the disabled.

2.53 As mentioned earlier, telecommunication services have become an essential part of peoples' lives. Services made available using telecommunications range from banking and education to M-Commerce, e-commerce and social media etc. Since mobile phones are the primary devices through which a user accesses the telecom services, it is crucial

that such devices have suitable accessibility features embedded for PwDs. Similarly, broadcasting services play a vital role in getting news and information to the public (especially in times of emergency) and provide an outlet for domestic media content. In addition, broadcasting can be useful for important educational purposes, by transmitting courses and other instructional material. Like mobile phones in telecom, set-top boxes play a vital role in getting broadcasting services to the end-users.

2.54 As mentioned in the forgoing paras, the Authority has analysed various regulatory approaches adopted by various countries which ensure accessibility of devices and services in those countries. However, the Authority notes that these are advanced economies where PwDs might already have availability of accessible products and services. Number of PwDs in these countries may not be as high as in India, where as per the last census (2011) the population of PwDs is 26.8million. Therefore, the model adopted by these countries may, perhaps, not be suitable for Indian market conditions. However, there is absolutely no doubt there is a need to run a time bound program to achieve universal accessibility, by design, of devices and services. The Authority is of the view that mobile manufacturers should be mandated to provide a certain number of mobile handsets in order to ensure that the needs of PwDs are met. Since this needs to be a gradual approach, the Authority is of the view that every mobile manufacturer who produces 5 or more different models of mobile handsets should provide at least one mobile handset satisfying the accessibility criteria for PwDs. This may be achieved by the end of 2020. From the year 2023 i.e. 5 years from now, all mobile and landline handsets manufactured or imported in India should be in accessible format meeting the accessibility standards as enumerated in these recommendations. Similarly all the TV set top box manufacturers should make atleast one type of set top box in accessible format by 2020 and

from 2023 onwards all settop boxes manufactured or imported in India should be in accessible format. There is also need that the Government should create and maintain a database of devices and ancillary equipment which satisfy the accessibility standards for ICT for PwDs. This should be available on Govt website(s) in accessible format.

2.55 In view of the above, **the Authority recommends that:**

a) Every mobile manufacturer who produces 5 or more different models of mobile handsets should provide at least one mobile handset satisfying the accessibility criteria for PwDs as enumerated in the recommendations. This may be achieved by the end of 2020.

b) All the TV set top box manufacturers or importers should make/import atleast one model in different variants of set top boxes in accessible format by 2020.

2.56 **The Authority recommends that the Government should create and maintain a database of devices and ancillary equipment which satisfy the accessibility standards for ICT for PwDs. This should be available on Govt website(s) in accessible format.**

F. Making assistive devices and ICT services affordable

2.57 One of the articles in UNCPRD states *“To undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies **at an affordable cost**”* Article 4 (g). [emphasis supplied]

2.58 In the CP, stakeholders were asked to comment on the issue whether the Government need to incentivise the manufacturing and development of ICT tools and devices viz. tools for mobile accessibility, TV accessibility or for web accessibility for PwDs and whether companies be encouraged to utilise their corporate social responsibility (CSR) funds or any other funds/funding mechanism for development of applications, devices and services for the PwDs. Further, they were asked to comment.

2.59 In response to the question on funding of assistive devices and services some stakeholders recommended that the Ministry of Corporate Affairs should amend Schedule VII of the Companies Act, 2013 to include references to ICT inclusion as part of the “Activities which may be included by companies in their corporate social responsibility policies” (as referenced under Section 135 of the Companies Act). Further, it has been suggested that besides corporate social responsibility (CSR) initiatives solely undertaken by private firms, forms of collaboration in the area of CSR may be considered with public sector organizations within public-private partnerships and policy networks. Few stakeholders suggested that a separate fund consisting of the CSR contributions made by the companies in this field should be created for applications, devices and services for PwDs. Contribution to such a fund should be incentivised through Income tax laws.

2.60 Stakeholders suggested that government subsidy, tax benefits and government funding/grants can be explored for funding. There was a suggestion that the budget of each ministry/department should have a provision for PwDs. Waiving of custom duties and fees could be another option that can be explored. Some stakeholders are of the view that India should attract foreign direct investment (FDI) and foreign investment for funding on research, manufacturing and delivery of applications, devices and services for PwDs. Few stakeholders also suggested that the USO

fund should be utilised. The rationale is that this is one of the original purpose of the USO fund, i.e. ensuring equal access to telecommunications to all citizens and that it is a recurring funding model not subject to year to year variations, allowing to build an accessibility infrastructure in a predictable way. One of the stakeholders pointed out that under the RPWD, Rules 2017, the National Fund can be utilized by the Government for the development of applications, devices and services.

2.61 Some other suggestions include - offering start-up funding for companies developing accessible ICT, public-private partnerships and prioritising procurement of accessible products.

2.62 All stakeholders, except for one, agreed that the Government should incentivise the manufacturing and development of ICT tools and devices viz. tools for mobile accessibility, TV accessibility or for web accessibility for PwDs. Possible incentives could be in the form of tax breaks, preference in government procurement, waivers of regulatory fees etc. One of the stakeholders pointed out that since the bargaining power of individuals in need of accessible ICT is not strong enough, demand side forces have not sufficed to make ICT conducive to usage by PwDs therefore there is a need to incentivize these by the Government. Further, the costs associated with such manufacturing or development is often given as a reason against making ICT accessible. It has also been suggested that TRAI could suggest a central funding mechanism by the government from Ministry for Information and Broadcasting, Department of Empowerment of Persons with Disabilities under Ministry for Social Justice and Empowerment, Council of Scientific and Industrial Research, and the Ministry of Science and Technology. Apart from ICT tools and devices, the Government should consider providing incentives and subsidies to the service providers and manufacturers which will

speed up the implementation of accessibility of content by PwDs. On the contrary one stakeholder has suggested that financial incentives are not needed for incentivising the manufacturing and development of ICT tools and devices.

Analysis

2.63 It is observed that a critical reason why PwDs are unable to access telecommunication and broadcasting services and assistive devices is the high cost of such services and devices. Though the Government has initiated a few programmes for funding the development and manufacture of assistive ICT devices more needs to be done by the government and corporate sector/companies.

2.64 Section 135 of the Companies Act, 2013 makes it mandatory (with effect from 1st April, 2014) for companies which fulfill certain criteria to undertake Corporate Social Responsibility(CSR) activities. Therefore, all such companies are required to spend, in every financial year, at least 2% of the average net profits of the company made during the three immediately preceding financial years, in pursuance of their Corporate Social Responsibility (CSR) Policy. Further, the Ministry of Corporate Affairs (MCA) has vide its circular clarified that provisions for aids and appliances to PwDs is covered under category of promoting health care including preventive health care.¹³ Accordingly, provisions stating that development of aids and appliances meant for the PwDs will count as part of CSR are already in place. The only need is to create awareness about the same. Regarding other form of funding requirement and

13 Ministry of Corporate Affairs, Clarifications with regard to provisions of Corporate Social Responsibility under section 135 of the Companies Act, 2013 available at: https://www.mca.gov.in/Ministry/pdf/General_Circular_21_2014.pdf

mechanism the Authority has already recommended that the steering committee will suggest the Govt from time to time.

2.65 On the Government side it can promote accessible devices by mandating procurement of devices having accessible features. In the United States, there are standards for electronic and information technology developed, procured, maintained, or used by Federal agencies. This is covered by section 508 of the Rehabilitation Act of 1973, as well as the guidelines for telecommunications equipment and customer premises equipment covered by Section 255 of the Communications Act of 1934. The Section 508 Standards are part of the Federal Acquisition Regulation (FAR) and address access for people with physical, sensory, or cognitive disabilities. They contain technical criteria specific to various types of technologies and performance-based requirements which focus on functional capabilities of covered products. Specific criteria cover software applications and operating systems, web-based information and applications, computers, telecommunications products, video and multimedia, and self-contained closed products. The United States Access Board' is responsible for implementation of these provisions. In January, 2018 the Board published final rule that updates the Section 508 Standards along with accessibility guidelines for telecommunication products and equipment covered by section 255 of the Communications Act. The revised technical requirements, which are organized along the lines of ICT functionality, provide requirements to ensure that covered hardware, software, electronic content, and support documentation and services are accessible to people with disabilities. The 'Section 508 Standards' apply to electronic and information technology procured by the federal government, including computer hardware and software, websites, multimedia such as video, phone systems, and copiers.

2.66 The Authority is of the view in order to promote products and services in accessible format, the Government should mandate all the government agencies that ICT products viz. Computer hardware, mobile phones, Set Top Boxes, support documentation and services should be accessible to PwDs. This will give a major boost to the manufacturing of the electronic devices in accessible form and it will also bring down the cost of such products.

2.67 Accordingly, **the Authority recommends that the Government should mandate all the government agencies that in procurement of ICT products viz Computer hardware, mobile phones, Set Top Boxes, it should be mandatory that these are accessible to PwDs. The associated support documentation and services should also be in accessible format for the PwDs.**

The Authority also recommends that all the Government Websites should be accessibility compliant to the PwDs.

G. Adoption of international standards

2.68 As mentioned earlier in this chapter, the purpose of the UNCRPD, is to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity. PwDs are not anymore considered as “objects” (charity, medical attention, social protection) but as “subjects” with their own rights and the ability to claim them.

2.69 There are several areas in the convention that member countries have to comply with. The convention details the sector specific accessibility stipulations with direct implications for:

- e-Government
- Media & Internet

- Education
- Employment
- Political Rights
- Emergency Response
- Culture & Leisure

2.70 Some of the relevant areas mentioned in respect of ICT area in UNCRPD are as follows¹⁴:

e-Government

- *“Providing information intended for the general public to persons with disabilities in accessible formats and technologies appropriate to different kinds of disabilities in a timely manner and without additional cost” - Article 21 (a);*
- *“Accepting and facilitating the use of sign languages, Braille, augmentative and alternative communication, and all other accessible means, modes and formats of communication of their choice by persons with disabilities in official interactions” - Article 21 (b);*
- *“In order to promote equality and eliminate discrimination, States Parties shall take all appropriate steps to ensure that reasonable accommodation is provided” - Article 5.3 (Applicable to all sectors, this disposition constitutes a strong obligation for all activities directly controlled by governments).*

Media and the Internet

- *“Encouraging the mass media, including providers of information through the Internet, to make their services accessible to persons with disabilities” - Article 21 (d)*

Emergency services

- *“...These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply... to Information, communications and other services, including electronic services and emergency services” - Article 9.1 (b)*

Obligation to define minimum standards

Article 9 on **Accessibility** specifies that *“States Parties shall also take appropriate measures to develop, promulgate and monitor the implementation of minimum standards and guidelines for the*

¹⁴ www.e-accessibilitytoolkit.org/toolkit/un_convention/accessibility_provisions

accessibility of facilities and services open or provided to the public,” - Article 9.2 (a).

General Obligations:

“To undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost” Article 4 (g).

2.71 In the CP, Stakeholders were posed a few questions in relation to accessibility of devices for PwDs for accessing telecommunications and broadcasting. Stakeholders were requested to comment whether international accessibility standards be adopted for telecommunication and broadcasting services and devices in India. They were also asked to suggest steps required to ensure their adoption by the service providers/device manufacturers.

2.72 In response, most respondents agreed that international accessibility standards should be adhered to in India too. As ICT interoperability is a major concern, adopting international accessibility standards is critical to ensure that Indian ICT products and services are on par with global products and services. Some of the stakeholders suggested that India should follow WCAG 2.0 (Web Content Accessibility Guidelines 2.0) and ensure its effective implementation. It has been pointed out that while India can adopt standards from international jurisdictions, the needs and socio-economic status of our country should also be taken into account. Further, it has also been advised that in public procurement, preference should be given to providers who comply with international standards. One of the respondents pointed out that this consultation paper is silent on the side of capacity building for production and broadcast of the content. One of the respondents also pointed out that India should adopt *internationally harmonised standards* as wireless devices are designed and manufactured for global markets.

2.73 In response to the question whether it should be mandated by the Government that the devices used for watching television should be made accessible to PwDs, most stakeholders were of the view that it should be mandated. The FCC rules in US have been cited as one of the examples of such a policy. FCC rules under Section 255 of the Communications Act require telecommunications equipment manufacturers and service providers to make their products and services accessible to people with disabilities, if such access is readily achievable. Another input was that on-screen menu and voice menu in Set-Top-Boxes should be accessible in regional languages. One of the stakeholders also pointed out that it is in the interest of manufacturers to produce devices accessible for PwDs, as they constitute a sizeable fraction of the Indian population. Another stakeholder was of the view that such mandate should only come about after categorising the various disabilities on the basis of degree of impairment. One of the stakeholders stated that, while Set-Top-Boxes should be made accessible, the responsibility of doing so lies with distributors and not broadcasters.

2.74 On the other hand, some stakeholders were of the view that mandating accessibility of devices for television might be too rigid a measure for the industry. It may hinder innovation and lead to increase in costs for the manufacturers. Another stakeholder was of the opinion that a rigid framework of specific requirements on devices can become redundant as technology changes. One of the stakeholders suggested that, instead of mandating accessibility, TRAI may collaboratively come up with non-binding guidelines which provide guidance on how telecom and broadcasting service providers can give full effect to provisions of the RPwD Act.

2.75 Some stakeholders suggested to adopt collaborative and incentive-based mechanism. Some stakeholders opined that extensive array of accessibility features are already available in the devices/applications for PwDs. Hence, awareness of these applications among the PwDs should be targeted instead of mandating features which may not be necessary.

Analysis:

2.76 As mentioned above, the Article 9 of UNCRPD casts an obligation on all the signatory governments to take appropriate measures to ensure to PwDs access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. The Convention, inter-alia, mandates that all the Governments shall also take appropriate measures: To develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public. India is a signatory to the UNCRPD and ratified it in the year 2007. India is also a signatory to the 'Biwako Millennium Framework (2002) for action towards an inclusive, barrier free and rights-based society. The 'Biwako Plus Five (2007) added the emphasis on further efforts towards an inclusive, barrier-free and rights-based society for persons with disabilities in Asia and the Pacific'. These international conventions cast upon obligation on the signatory countries to have legislation policy or a framework to ensure equality for those with disability. Electronics and ICTs are key enablers in mitigating barriers faced by PwDs. Many countries have prepared/adopted accessibility standards for PwDs.

2.77 In October,2013 the Govt approved the ‘National Policy on Universal Electronic Accessibility’ to eliminate discrimination on the basis of disabilities. The policy aimed to facilitate equal and unhindered access to electronics and ICT products and services by PwDs (both physically and mentally challenged) and to facilitate local language support for the same.

The following strategies are envisaged for the implementation of the policy:

- Creating awareness on universal electronics accessibility and universal design.
- Capacity building and infrastructure development.
- Setting up of model electronics and ICTs centres for providing training and demonstration to special educators and physically as well as mentally challenged persons.
- Conducting research and development, use of innovation, ideas, technology etc. whether indigenous or outsourced from abroad.
- Developing programme and schemes with greater emphasis for differently abled women/children.
- Developing procurement guidelines for electronics and ICTs for accessibility and assistive needs.

2.78 So far as ICT accessibility is concerned, hardware and software are available today which can address the needs of users with various types of impairments: visual, cognitive, hearing, speech, physical. For example:

- Blind and visually impaired people can adjust display settings such as font size or color contrast. Further, such PwDs can use text-to-speech to access menus, receive audio feedback and have text, such as SMS, read aloud;

- Pictorial address books (containing an image of the person beside their name and phone number) has considerably empowered some people with cognitive disabilities to use cell phones;
- Deaf persons can use a range of services including:
 - SMS text messages
 - Sign language via video calls (on 3G/4G networks)
 - Persons unable to use a keypad can use voice recognition software.

2.79 As technology continues to evolve, mobile phones and high-end PDAs (Personal Digital Assistant) become a prime platform for assistive technology by providing additional functionalities such as easy to use emergency keys, integrated GPS for geo-positioning, text scanning capabilities with optical character recognition to read documents aloud with text to speech software, or a mini Daisy reader to read downloaded books aloud. For specific conditions such as hard of hearing users, bone conduction to transmit sounds to the inner ear is available. Furthermore, by using 3G/4G connectivity, Wi-Fi and Bluetooth technologies using smart phones to enhance proximity and mobility services for persons with disabilities. There are several device manufacturers viz. Nokia, Samsung, Apple etc who are manufacturing handsets with accessibility features¹⁵ Like:

- a grips for improved stability;
- b audio/voice interaction with user interface through voice dialling/response and third-party apps;
- c voice dialling, voice recorder, and voice commands with an integrated hands-free speaker;

¹⁵ <https://www.itu.int/en/ITU-D/Digital.../ICT%20Accessibility%20Policy%20Report.pdf>

- d Special provision where speaker's voice is automatically played through the phone's loudspeakers;
- e dial-out buffer memory that gives more time to complete a process;
- f pre-recorded voice command facility for popular functions
- g fully accessible touch screen technology
- h gesture-based screen-reader
- i magnification and zoom functions

2.80 For Landline phones the Accessible features can be:

- a) Large button phones
- b) High contrast large number keys
- c) Voice controlled calling
- d) Stored number calling on specific memory keys with opportunity to have pictures of the destination on the keys
- e) Extra loud ringing tone
- f) Flash on incoming calls
- g) Programmable dialer with possibility to have pictures on the buttons
- h) Self voicing function that allows use of all features and functions without vision
- i) Ability to operate all touch screen functions with gesture (coupled with voice)
- j) Ability to use full phone without vision or gesture (directly or via connected device)
- k) Ability to connect a Braille reader
- l) Ability to install or activate a screen reader
- m) Standardized external interfaces so that it is possible to connect standardized attachments and assistive devices

Broadcasting Services

2.81 In broadcasting sector, with digital access system becoming compulsory in India, cable television can be broadcast only in digital encrypted

format which requires television sets to be connected to a set top box (STB). Therefore, this creates a strong case for STBs becoming compatible for visually impaired viewers by providing audibly accessible options.

2.82 Some of the countries have mandated STBs to be accessible to visually impaired or blind persons with user option which does not require vision. For instance, FCC Accessibility Rules formulated under Section 255 of the Communications Act requires devices used for watching television provided through cable, satellite, telephone company fibre, etc. accessible to PwDs.¹⁶ Under the present FCC rules, the mandate is that any such device which provides certain functions as on-screen text menus or guides, must be audibly accessible to people with visual impairment or are blind. These functions are:¹⁷

- Channel/program selection
- Display of channel/program information
- Setup options
- Closed captioning control and display options
- Video description control
- Current configuration information
- Playback controls (such as play, pause, rewind, fast forward, stop, and record)
- Input source selection
- power on/off, volume adjust, and mute functions in accessible form by providing at least one mode that does not require user

¹⁶ FCC, Accessible TV and Set-Top Box Controls, Menus and Program Guides, available at: <https://www.fcc.gov/consumers/guides/accessible-tv-and-set-top-box-controls-menus-and-program-guides>.

¹⁷ Ibid.

vision or colour perception, and permits operation by users with low vision, without relying on audio output.

2.83 In the U.K. Electronic Program Guide (EPG)¹⁸ providers are governed under the Communications Act, 2003 which requires them to incorporate such features in their EPGs which is compatible, to the extent possible, for PwDs. Since the functionality of EPGs is dependent upon STB hardware and software, EPG providers work in collaboration with disability groups and STB manufacturers to develop EPGs compatible for PwDs.¹⁹

2.84 By making certain changes in the programme and by use of assistive technologies Television can be made accessible for the PwD e.g. well-designed remote control with legible buttons. There could also be a wireless connection between a television and the viewer's hearing aid.

2.85 For viewers who have hearing impairment since birth will benefit from signing and some may be able to follow captioning. For viewers who developed hearing impairment (oralists), most will benefit from captioning, unless they also have visual impairments. For viewers with hearing impairments who use hearing aids, being able to hear the programme can be helped by the use of wireless connections between the television receiver and the hearing aid itself. Closed captioning of the programme will also help many to follow fast colloquial speech, unless they have vision or reading impairments.

¹⁸ EPGs are screen-based menus of channels and/or programmes which allow viewers of multi-channel television services to click through to the channel of their choice using their remote control.

¹⁹ Ofcom, Code of Practice on Electronic Programme Guides, available at: https://www.ofcom.org.uk/_data/assets/pdf_file/0031/19399/epgcode.pdf.

2.86 For viewers who have sight impairments since birth the main access option for television programmes in vernacular language is audio captioning (also known as audio subtitles or spoken subtitles). Currently services of this kind use speech synthesis at the broadcaster playout center to generate an additional audio track. This can be delivered using the same mechanisms as audio description.

2.87 The Government can mandate the provision of information to the PwDs in accessible form, in case they opt for the same. In addition, steps can be taken to mandate development of certain percentage of channels meant only for PwDs viz audio and visual captioning, additional audio track etc. The Authority is of the view that there should be phasewise-time bound plans to develop percentage of channels with the aim to have 50% channels in accessible format in 5 years time frame. To start with there can be 5% channels in accessible format in one year, 10% in two years time and 50% in 5 years.

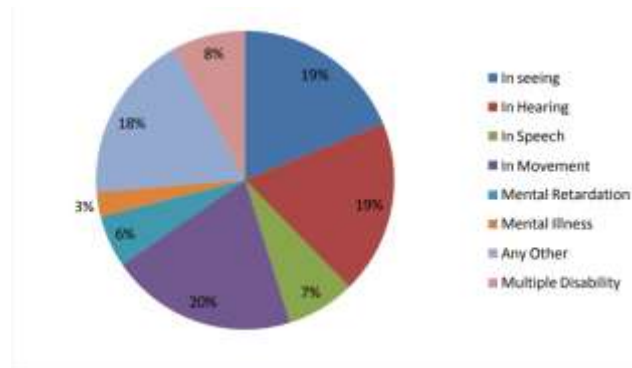
2.88 As per The UN Convention on the Rights of Persons with Disabilities Article 9.2(a), governments are required to establish accessibility standards. Accordingly, governments can promote ICT accessibility standards, and adopt international standards to the greatest possible extent to achieve economies of scale to lower cost and ensure interoperability at the same time. In India too, steps need to be taken for adoption of accessibility standards²⁰ for services, devices and channels in telecommunication and broadcasting sectors.

2.89 As per Census, 2011 in India, 20% of the PwDs are having disability in movement, 19% are with disability in seeing, 19 % are with disability in

²⁰ http://www.e-accessibilitytoolkit.org/toolkit/international_cooperation/international_standards_development

hearing and 8% has multiple disabilities. The distribution of disability is as per the chart below²¹:

PwD : type of Disability in India - Census, 2011



2.90 Looking at the types of disabilities as above, based on available technology and features in various phones being manufacture and based on International accessibility standards, **the Authority recommends that the following accessibility standards for Mobile, Landline phones and for Set Top Boxes(STBs) in India:**

(a) Accessibility Standards for Mobile Phones:

- a) grips for improved stability;
- b) audio/voice interaction with user interface through voice dialling/response and third party apps;
- c) voice dialling, voice recorder, and voice commands with an integrated hands-free speaker;
- d) Special provision where speaker's voice is automatically played through the phone's loudspeakers;
- e) pre-recorded voice command facility for popular functions
- f) fully accessible touch screen technology
- g) magnification and zoom functions

²¹ http://mospi.nic.in/sites/default/files/publication_reports/Disabled_persons_in_India_2016.pdf

(b) Accessibility Standards for Landline Phones:

- a) **Large button phones**
- b) **Voice controlled calling**
- c) **Stored number calling on specific memory keys with opportunity to have pictures of the destination on the keys**
- d) **Extra loud ringing tone**
- e) **Flash on incoming calls**
- f) **Programmable dialer with possibility to have pictures on the buttons**
- g) **Self voicing function that allows use of all features and functions without vision**
- h) **Ability to use full phone without vision or gesture (directly or via connected device)**
- i) **Ability to connect a Braille reader**
- j) **Ability to install or activate a screen reader**
- k) **Standardized external interfaces so that it is possible to connect standardized attachments and assistive devices**

(c) Accessibility Standards for Set top boxes : STBs should have the following features:

- a) **Channel/program selection**
- b) **Display of channel/program information**
- c) **Setup options**
- d) **Closed captioning control and display options**
- e) **Video description control**
- f) **Current configuration information**
- g) **Playback controls (such as play, pause, rewind, fast forward, stop, and record)**
- h) **Input source selection**

- i) power on/off, volume adjust, and mute functions in accessible form by providing at least one mode that does not require user vision or colour perception, and permits operation by users with low vision, without relying on audio output.**

2.91 The Authority recommends that Broadcasting channels may be developed in accessible format too for PwDs with audio & visual impairment as per the following plan:

- a. Within one year -5% of the channels**
- b. Within two years -10% of the channels**
- c. Within five years -50% of the channels**

Chapter-III : Summary of recommendations

- 3.1 The Authority recommends that the types of disabilities, as specified in the RPwD Act, 2016 are comprehensive and do not require modification for the purpose of formulating policies enabling ICT access for PwDs. [Para 2.9]**
- 3.2 The Authority recommends that in order to ensure accessibility of ICT services to the PwDs a steering committee under aegis of Department of Empowerment of Persons with Disabilities should be formed. Other members in the committee should be from DoT, MIB, MeitY, Ministry of Corporate Affairs and Ministry of Finance. The Terms of Reference for the committee should be to:**
- (a) review from time to time whether the ICT benefits as envisaged in the RPWD Act,2016 are reaching to the PwDs;**
 - (b) suggest additional measures required to be taken by the Govt including funding requirements and mechanism;**
 - (c) formulate guidelines and suggest an implementation and monitoring mechanism so as to improve ICT accessibility for PwDs;**
 - (d) collaborate with state governments for proper coordination and harmonise the activities to be undertaken. [Para 2.18]**
- 3.3 The Authority recommends that the measures suggested by ITU to address the ICT challenges for PwDs, as indicated in para 2.19, should be adopted in India. [Para 2.21]**
- 3.4 The Authority recommends that the Government should mandate the device manufacturers/importers not to curtail the accessibility features available in popular operating systems in any manner from their devices (manufactured or imported in India). An undertaking to this effect may be taken from them**

when their device models come for certification in the Government approved labs. [Para 2.35]

3.5 The Authority recommends that:

- (a) All TSPs should identify existing mobile/landline numbers of their customers who are eligible to be classified under PwD. Provision should be made in the Customer Acquisition Form (CAF) for registering new customers as 'PwD' in case he/she is a PwD. All such numbers should be assigned a special category.**
- (b) TSPs, MSOs and DTH Operators should have a special desk in their Call Centres/Customer support centres where calls received from special category numbers are routed to this specialised desk which should be manned by person(s) to receive calls from PwDs using assistive technologies.**
- (c) While implementing the 'Integrated Emergency Communication and Response System (IECRS)' Recommendations of the Authority, the Government should make provision for a special desk in each of the Public Safety Answering Point (PSAP) where the attendant executive should accept the calls/SMSs/social media calls/SMSs from PwDs and provide them immediate assistance. This desk should have a relay center dedicated to requests coming from deaf and speech-impaired end-users. A call received from such numbers (having a defined category) should be routed to the dedicated desk so that PwDs in emergency can be provided immediate assistance.**
- (d) TSPs, MSOs/DTH and PSAP operators should ensure that the executives that deal with PwD customers have been given**

sensitivity training from time to time so as to understand and deal with the issues raised by PwDs. [Para 2.46]

3.6 The Authority recommends that DoT and MIB may instruct TSPs and DTH/MSOs to conduct frequent awareness campaigns regarding issues of accessibility, design, affordability and information pertaining to assistive products available to PwDs and the various government policies/schemes pertaining to accessible ICT that can be availed by PwDs [Para 2.51]

3.7 The Authority recommends that:

a) Every mobile manufacturer who produces 5 or more different models of mobile handsets should provide at least one mobile handset satisfying the accessibility criteria for PwDs as enumerated in the recommendations. This may be achieved by the end of 2020.

b) All the TV set top box manufacturers or importer should make/import atleast one model in different variants of set top boxes in accessible format by 2020.

[Para 2.55]

3.8 The Authority recommends that the Government should create and maintain a database of devices and ancillary equipment which satisfy the accessibility standards for ICT for PwDs. This should be available on Govt website(s) in accessible format.

[Para 2.56]

3.9 The Authority recommends that the Government should mandate all government agencies that in procurement of ICT products viz Computer hardware, mobile phones, Set Top Boxes, it should be

mandatory that these are accessible to PwDs. The associated support documentation and services should also be in accessible format for the PwDs. [Para 2.67]

3.10 The Authority recommends that all the Government Websites should be accessibility compliant to the PwDs. [Para 2.67]

3.11 The Authority recommends that the following accessibility standards for Mobile, Landline phones and for Set Top Boxes(STBs) in India:

(a) Accessibility Standards for Mobile Phones:

- a) grips for improved stability;**
- b) audio/voice interaction with user interface through voice dialling/response and third party apps;**
- c) voice dialling, voice recorder, and voice commands with an integrated hands-free speaker;**
- d) Special provision where speaker's voice is automatically played through the phone's loudspeakers;**
- e) pre-recorded voice command facility for popular functions**
- f) fully accessible touch screen technology**
- g) magnification and zoom functions**

(b) Accessibility Standards for Landline Phones:

- a) Large button phones**
- b) Voice controlled calling**
- c) Stored number calling on specific memory keys with opportunity to have pictures of the destination on the keys**
- d) Extra loud ringing tone**
- e) Flash on incoming calls**
- f) Programmable dialer with possibility to have pictures on the buttons**

- g) Self voicing function that allows use of all features and functions without vision**
- h) Ability to use full phone without vision or gesture (directly or via connected device)**
- i) Ability to connect a Braille reader**
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(c) Accessibility Standards for Set top boxes : STBs should have the following features:

- a) Channel/program selection**
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- f) Current configuration information**
- g) Playback controls (such as play, pause, rewind, fast forward, stop, and record)**
- h) Input source selection**
- i) power on/off, volume adjust, and mute functions in accessible form by providing at least one mode that does not require user vision or colour perception, and permits operation by users with low vision, without relying on audio output. [Para 2.90]**

3.12 The Authority recommends that Broadcasting channels may be developed in accessible format too for PwDs with audio & visual impairment as per the following plan:

- a. Within one year -5% of the channels**
- b. Within two years -10% of the channels**
- c. Within five years -50% of the channels [Para 2.91]**

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List of Acronyms

Abbreviation	Description
ADA	Americans with Disabilities Act
apps	applications
ATM	Automated Teller Machine
CRTC	Canadian Radio-television and Telecommunication Commission
DeitY	Department of Electronics and Information Technology
DoT	Department of Telecommunications
DTH	Direct to Home
EPG	Electronic Program Guide
FCC	Federal Communications Commission
GPS	Global Positioning System
ICT	Information and Communication Technology
IECRS	Integrated Emergency Communications and Response System
IoT	Internet of Things
ITU	International Telecommunication Union
IVR	Interactive voice response
LBS	Location Based Services
MCA	Ministry of Corporate Affairs
MIC	The Ministry of Internal Affairs and Communications
NRS	National Relay Service
Ofcom	Office of Communications
PCs	Personal Computers
PSAP	Public Safety Answering Points
PwDs	Persons with disabilities
SMS	Short-Message Service
SPs	Service Providers
SRC	Speech rate conversion
STB	Set Top Box
STS	Standard Telephone Service
TDD	Telecommunications Device for the Deaf

RPWD, 2016	Rights of Persons with Disabilities Act, 2016
TCPSS Act	The Telecommunications (Consumer Protection and Service Standards) Act 1999
TRS	Telecommunications Relay Service
TSPs	Telecom Service Providers
TTYs	Teletypewriters
UI	User interfaces
UK	United Kingdom
UNCRPD	The United Nations Convention on the Rights of Persons with Disabilities
USO	Universal Service Obligation
USOF	Universal Service Obligation Fund
USP	Universal Service Provider
USSD	Unstructured Supplementary Service Data
WCAG 2.0	Web Content Accessibility Guidelines 2.0